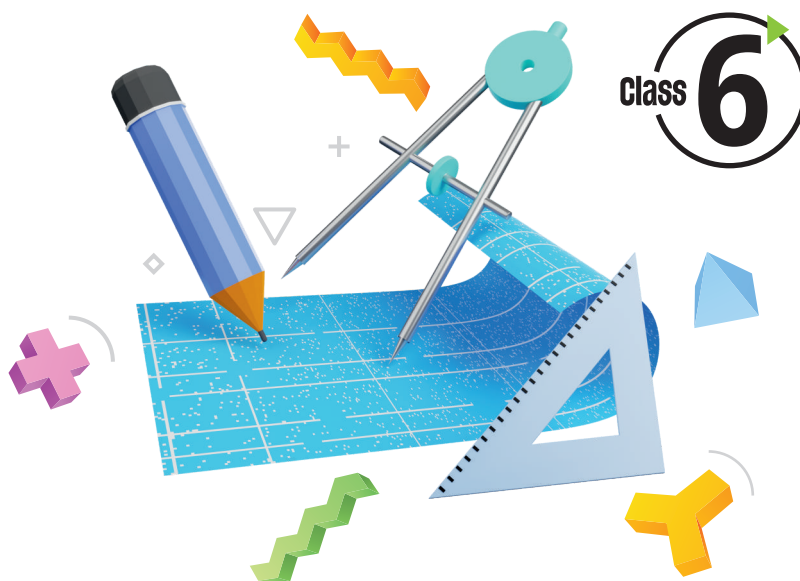




FOCUS Maths

A Complete Course in Mathematics

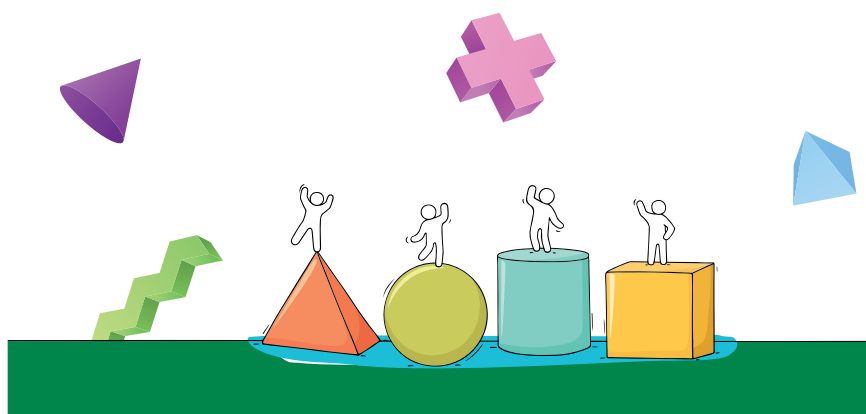
Solution Manual



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Number System



EXERCISE- 1A

1. Write the numeral for each of the following number names:
 - (i) Nine thousand eighteen = **9018**
 - (ii) Fifty-four thousand seventy-three = **54073**
 - (iii) Three lakh two thousand five hundred six = **302506**
 - (iv) Twenty lakh ten thousand eight = **2010008**
2. Write the number names of the following numbers in both the Indian and the International place value systems:
 - (i) 12450
Indian → Twelve thousand four hundred fifty
International → Twelve thousand four hundred fifty
 - (ii) 203105
Indian → Two lakh three thousand one hundred and five
International → Two hundred three thousand one hundred and five
 - (iii) 7845691
Indian → Seventy eight lakhs fourty five thousands six hundred and ninty one
International → Seven million eight hundred forty five thousands six hundred and ninety one
 - (iv) 601245312
Indian → Sixty crore twelve lakh forty five thousand three hundred twelve
International → Six hundred one million two hundred forty five thousand three hundred and twelve
3. Write each of the following numbers in expanded form:
 - (i) $3,08,927 = 3 \times 100000 + 0 \times 10000 + 8 \times 1000 + 9 \times 100 + 2 \times 10 + 7 \times 1$
 - (ii) $24,05,609 = 2 \times 1000000 + 4 \times 100000 + 0 \times 10000 + 5 \times 1000 + 6 \times 100 + 0 \times 10 + 9 \times 1$
 - (iii) $9,10,10,510 = 9 \times 10000000 + 1 \times 1000000 + 0 \times 100000 + 1 \times 10000 + 0 \times 1000 + 5 \times 100 + 1 \times 10 + 0 \times 1$
 - (iv) $5,36,18,493 = 5 \times 10000000 + 3 \times 1000000 + 6 \times 100000 + 1 \times 10000 + 8 \times 1000 + 4 \times 100 + 9 \times 10 + 3 \times 1$

4. Write the corresponding numeral for each of the following:
- (i) $3 \times 100000 + 4 \times 10000 + 8 \times 1000 + 7 \times 100 + 6 \times 10 + 4 \times 1 = \mathbf{3,48,764}$
- (ii) $9 \times 10000 + 7 \times 1000 + 5 \times 100 + 3 \times 10 + 4 \times 1 = \mathbf{97,534}$
5. Find the difference between the place values of:
- (i) 5's in 43,56,78,512
- Place value of 5 in 435678512 = 5000000
- Place value of 5 in 435678512 = 500
- \therefore Difference = $5000000 - 500$
= 4999500
- (ii) 9's in 1,97,819
- Place value of 9 in 197819 = 90000
- Place value of 9 in 197819 = 9
- \therefore Difference = $90000 - 9$
= 89991
6. All 3-digit numbers using digits 2, 7 and 1 are :
- 271, 172, 721, 712, 127, 217
- All 3-digit numbers are six.
- Ascending order = 127, 172, 217, 271, 712, 721
7. Greatest 7-digit number = 9999999
- Smallest 7-digit number = 1000000
- \therefore Total number of 7-digit numbers in all = $9999999 - 1000000 + 1$
= 9000000
8. Number of thousands to make a crore = $\frac{10000000}{1000} = 10000$ thousands
9. Using the digits = 3, 1, 0, 5 and 7
- \therefore The smallest number = 10357
10. Using the digits = 2, 4, 0, 3, 6 and 9
- \therefore The largest number = 964320

EXERCISE- 1B

1. Compare the following and write the appropriate symbols ($>$ / $<$) :
- (i) 3254790 $\boxed{<}$ 3260152 (ii) 10357690 $\boxed{<}$ 11243567
- (iii) 27596381 $\boxed{>}$ 7965412 (iv) 47893501 $\boxed{<}$ 47894021
2. Arrange the following numbers in ascending order :
- (i) 74562187, 21567891, 5345678, 3052678, 4356720
- Ascending order** \rightarrow 3052678, 4356720, 5345678, 21567891,

74562187

(ii) 999901, 24500123, 24567812, 102123, 1112222, 100123

Ascending order → 100123, 102123, 999901, 1112222, 24500123, 24567812

3. Arrange the following numbers in descending order :

(i) 190909, 1808088, 16060666, 16007777, 181888, 1808090

Descending order → 16060666, 16007777, 1808099, 1808088, 190909, 181888

(ii) 5032786, 23794206, 5032790, 23756819, 687876

Descending order → 23794206, 23756819, 5032790, 5032786, 687876

EXERCISE- 1C

Convert the following :

1. 50 million = _____ lakh

We know, 1 million = 10 lakh

So, 50 million = 50×10 lakh
= 500 lakh

2. 25 billion = _____ crore

We know, 1 billion = 100 crore

So, 25 billion = 25×100 crore
= 2500 crore

3. 100 billion = _____ crore

We know, 1 billion = 100 crore

So, 100 billion = 100×100 crore
= 10000 crore

4. 45 million = _____ crore

We know, 1 million = $\frac{1}{10}$ crore

So, 45 million = $45 \times \frac{1}{10}$ crore
= 4.5 crore

5. 10 billion = _____ lakh

We know, 1 billion = 10000 lakh

So, 10 billion = 10×10000 lakh
= 100000 lakh

6. 130 million = _____ crore

We know, 1 million = $\frac{1}{10}$ crore

So, 130 million = $130 \times \frac{1}{10}$ crore
= 13 crore

7. 18 billion = _____ crore

We know,

1 billion = 100 crore

So, 18 billion = 18×100 crore
= 1800 crore

8. 15 billion = _____ lakh

We know,

1 billion = 10000 lakh

So, 15 billion = 15×10000 lakh
= 150000 lakh

9. 600 million = _____ lakh
We know,
1 million = 10 lakh
So, 600 million = 600×10 lakh
= 6000 lakh

10. 3 billion = _____ lakh
We know,
1 billion = 10000 lakh
So, 3 billion = 3×10000 lakh
= 30000 lakh

$$\begin{aligned} \text{(ii) Cost of 1 flat} &= ₹ 578450 \\ \text{Cost of 10 flats} &= ₹ 578450 \times 10 \\ &= ₹ 5784500 \end{aligned}$$

$$\begin{aligned} \text{(iii) Cost of 1 flat} &= ₹ 578450 \\ \text{Cost of 18 flats} &= ₹ 578450 \times 18 \\ &= ₹ 10412100 \end{aligned}$$

578450
× 18
4627600
5784500
<hr/> 10412100

$$\begin{aligned} \text{(iv) Cost of 1 flat} &= ₹ 578450 \\ \text{Cost of 8 flats} &= ₹ 578450 \times 8 \\ &= ₹ 4627600 \end{aligned}$$

578450
× 8
<hr/> 4627600

5. We know,

$$\text{Distance} = 1600 \text{ km}$$

$$\text{Time} = 32 \text{ hours}$$

According to question,

$$\begin{aligned} \text{Speed of the car} &= \frac{1600}{32} & \left[\because \text{Speed} = \frac{\text{Distance}}{\text{Time}} \right] \\ &= 50 \text{ km/hr} \end{aligned}$$

$$6. \text{ Number of people only primary education} = 1545624$$

$$\text{Number of people only secondary education} = 8895678$$

$$\text{Number of people only higher education} = 7873852$$

$$\text{Number of people only illiterate} = 3584348$$

$$\text{The number of children below the age of school admission} = 758080$$

The total population of the state

$$\begin{aligned} &= 1545624 + 8895678 + 7873852 + 3584348 + 758080 \\ &= 22657582 \end{aligned}$$

C	TL	L	T	Th	Th	H	T	O
	1	5	4	5	6	2	4	
+	8	8	9	5	6	7	8	
+	7	8	7	3	8	5	2	
+	3	5	8	4	3	4	8	
+		7	5	8	0	8	0	
<hr/>								
	2	2	6	5	7	5	8	2

Hence, the total population of the state is 2, 26, 57, 582.

7. Required number = $13246510 - 4658842$
 $= 8587668$

	C	TL	L	T	Th	Th	H	T	O
	1	3	2	4	6	5	1	0	
-	4	6	5	8	8	4	2		
	8	5	8	7	6	6	8		

8. Length of a wire = 625 m
 Number of pieces of the same length = 25
 The length of each piece = $(625 \div 25)$ m
 $= 25$ m

	25
25	625
-	50
	125
-	125
	0

Hence, the length of each piece is 25 m.

9. The sum of two numbers = 25758098
 One number = 6667840
 Other number = $25758098 - 6667840$
 $= 19090258$

	C	TL	L	T	Th	Th	H	T	O
	2	5	7	5	8	0	9	8	
-	6	6	6	7	8	4	0		
	1	9	0	9	0	2	5	8	

Hence, the other number is 19090258.

10. Required number = $10000000 - 5643879$
 $= 4356121$

	C	TL	L	T	Th	Th	H	T	O
	1	0	0	0	0	0	0	0	
-	5	6	4	3	8	7	9		
	4	3	5	6	1	2	1		

MULTIPLE CHOICE QUESTIONS

- The successor of 1 million is 1000001.
 Hence, the correct option is (b).
- Number of even numbers between 58 and 80 is 10.
 Hence, the correct option is (a).
- The product of successor and predecessor of 999 is 998000.
 Hence, the correct option is (b).
- The product of a non-zero whole number and its successor is always an even number.
 Hence, the correct option is (a).
- Which of the following statements is not true? $0 \div 0 = 0$
 Hence, the correct option is (d).
- If 1 is added to the greatest 7-digit number, it will be equal to 1 crore.
 Hence, the correct option is (d).
- In Indian System of Numeration, the number 58695376 is written as 5,86,95,376.
 Hence, the correct option is (d).
- One million is equal to 10 lakh.
 Hence, the correct option is (b).



Whole Numbers



EXERCISE-2

1. Write the successor of each of the following :

(i) 100

The successor of 100 = $(100 + 1) = 101$

(ii) 99

The successor of 99 = $(99 + 1) = 100$

(iii) 7500

The successor of 7500 = $(7500 + 1) = 7501$

(iv) 8888

The successor of 8888 = $(8888 + 1) = 8889$

2. Write the predecessor of each of the following :

(i) 201

The predecessor of 201 = $(201 - 1) = 200$

(ii) 8000

The predecessor of 8000 = $(8000 - 1) = 7999$

(iii) 445

The predecessor of 445 = $(445 - 1) = 444$

(iv) 500898

The predecessor of 500898 = $(500898 - 1) = 500897$

3. The largest 4-digit number = 9999

The smallest 4-digit number = 1000

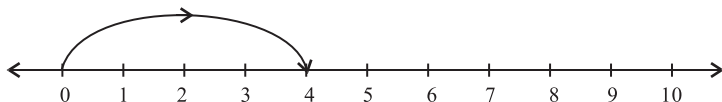
The successor of 9999 = $(9999 + 1) = 10000$

The successor of 1000 = $(1000 + 1) = 1001$

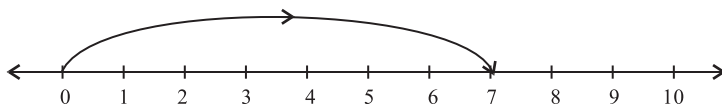
∴ Required number = $10000 - 1001 = 8999$

4. Represent the following numbers on the number line :

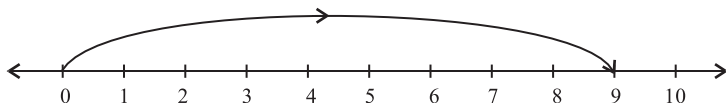
(i) 4



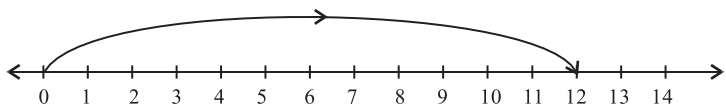
(ii) 7



(iii) 9



(iv) 12

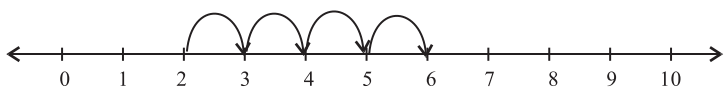


5. Find the following sums on the number line :

(i) $2 + 4$

\therefore

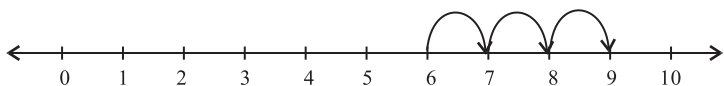
$$2 + 4 = 6$$



(ii) $6 + 3$

\therefore

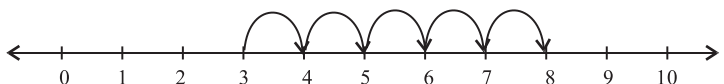
$$6 + 3 = 9$$



(iii) $3 + 5$

\therefore

$$3 + 5 = 8$$



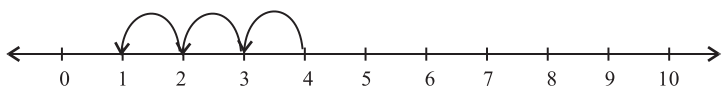
6. Find the following differences on the number line :

(i)

$$4 - 3$$

\therefore

$$4 - 3 = 1$$

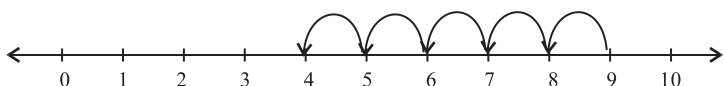


(ii)

$$9 - 5$$

\therefore

$$9 - 5 = 4$$

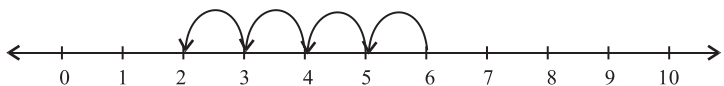


(iii)

$$6 - 4$$

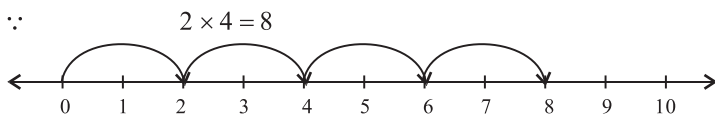
\therefore

$$6 - 4 = 2$$

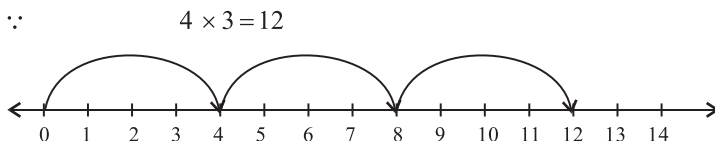


7. Find the following products on the number line :

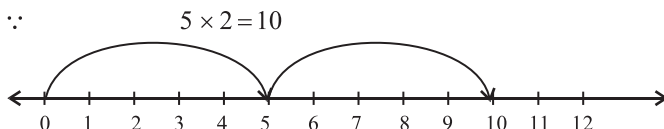
(i) 2×4



(ii) 4×3



(iii) 5×2



MULTIPLE CHOICE QUESTIONS

- Find the value of a if $7589 - a = 3434 \Rightarrow a = 4155$
Hence, the correct option is (a).
- The smallest whole number is 0.
Hence, the correct option is (b).
- The largest number of 6 digits which is exactly divisible by 16 is 999984.
Hence, the correct option is (c).
- What whole number is nearest to 457 which is divisible by 11 is 462.
Hence, the correct option is (d).
- The sum of two odd numbers is an even number.
Hence, the correct option is (b).
- The product of two odd numbers is an odd number.
Hence, the correct option is (a).



Integers



EXERCISE- 3A

1. Find the absolute value of the following :

(i) 12

The absolute value of 12, written as $|12|$ is 12.

(ii) -8

The absolute value of -8 , written as $|-8|$, is 8.

(iii) 9

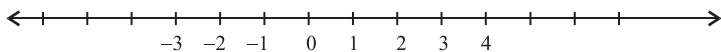
The absolute value of 9, written as $|9|$, is 9.

(iv) -4

The absolute value of -4 , written as $|-4|$, is 4.

2. List the integers between the given numbers using a number line. Also, write the greatest and smallest integer among them :

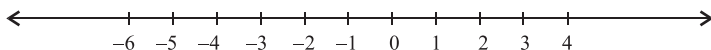
(i) 5 and -4



Greatest integer = 4

Smallest integer = -3

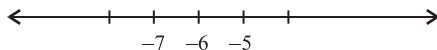
(ii) -7 and 5



Greatest integer = 4

Smallest integer = -6

(iii) -8 and -4



Greatest integer = -5 ; Smallest integer = -7

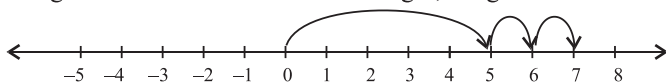
3. Solve the following using the number line :

(i) $5 - (-2)$

Additive inverse of $-2 = +2$.

Instead of subtracting as $5 - (-2)$, we can add it as $5 + 2$.

Starting from 5 move 2 units towards right, we get:



So,

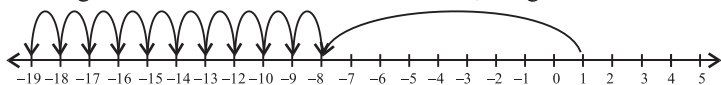
$$5 - (-2) = 5 + 2 = 7$$

(ii) $-8 - (11)$

Additive inverse of $+11 = -11$.

Instead of subtracting as $(-8) - (+11)$, we can add it as $(-8) + (-11)$.

Starting from -8 move 11 units towards left, we get :



So, $(-8) - (11) = (-8) + (-11) = -19$

(iii) $(-3) - (-4)$

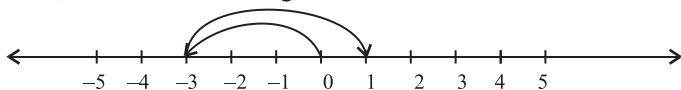
Additive inverse of $-4 = +4$.

Instead of subtracting as $(-3) - (-4)$, we can add it as $(-3) + (+4)$.

We start at zero facing positive direction.

Move 3 units backward to represent (-3) .

Then, turn towards the negative side and move 4 units backwards.



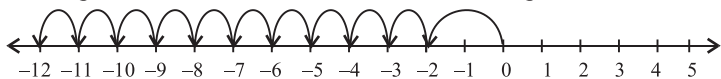
So, $(-3) - (-4) = -3 + 4 = +1$

(iv) $(-2) - (10)$

Additive inverse of $+10 = -10$.

Instead of subtracting as $(-2) - (+10)$, we can add it as $(-2) + (-10)$.

Starting from -2 move 10 units towards left, we get :



So, $(-2) - (10) = (-2) + (-10) = -12$

4. Arrange the following numbers in ascending order :

(i) $-65, -23, 46, 78, 98, 33$

Ascending order $\rightarrow -65, -23, 33, 46, 78, 98$

(ii) $-6, -4, -9, -2, -3, -8$

Ascending order $\rightarrow -9, -8, -6, -4, -3, -2$

5. Arrange the following numbers in descending order :

(i) $-84, -81, 83, 82, -85, 87$

Descending order $\rightarrow 87, 83, 82, -81, -84, -85$

(ii) $-32, 67, 24, 39, -41, 88$

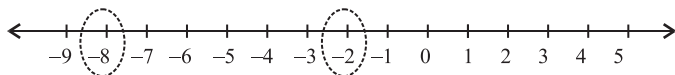
Descending order $\rightarrow 88, 67, 39, 24, -32, -41$

6. Compare the following pairs of integers using $>$ or $<$:

(i) $-8 \square -2$

First let us represent -8 and -2 on the number line. Observe that -8 is on the left of -2 on the number line.

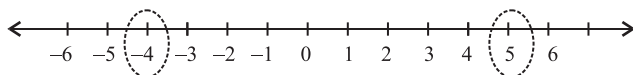
Therefore, -8 is less than -2 . That is $-8 < -2$.



(ii) $5 \square -4$

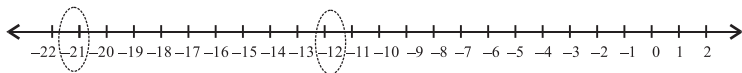
First let us represent 5 and -4 on the number line. Observe that 5 is on the right of zero and -4 is on the left of zero. So, 5 is greater than -4 .

That is $5 > -4$



(iii) $-21 \square -12$

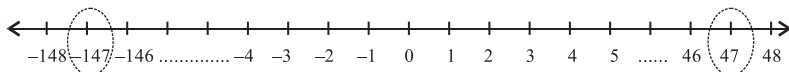
First let us represent -21 and -12 on the number line. Observe that -21 is on the left of -12 on the number line. Therefore, -21 is less than -12 . That is $-21 < -12$.



(iv) $47 \square -147$

First let us represent 47 and -147 on the number line. Observe that 47 is on the right of zero and -147 is on the left of zero. So, 47 is greater than -147 .

That is $47 > -147$.



7. Simplify :

(i) $10 + (-5) + 5 = 10 + (-5) + 5$
 $= 15 + (-5)$
 $= 10$

(ii) $2 - (-7) - 5 = 2 - (-7) - 5$
 $= 9 - 5$
 $= 4$

(iii) $-15 - [-4 + (4) + 8 + (-8)] = -15 - [(-4) + 4 + 8 + (-8)]$
 $= -15 - [(-12) + 12]$
 $= -15 - (0) = -15$

EXERCISE- 3B

1. State the product in the following multiplication problems :

(i) $(-6) \times (8) = -48$

(ii) $(-10) \times (-1) = 10$

(iii) $(4) \times (-2) = -8$

(iv) $(1) \times (-5) = -5$

2. Find the product of the following :

(i) $(-10) \text{ by } 5 = (-10) \times 5$
 $= -50$

(ii) $9 \text{ by } (-6) = 9 \times (-6)$
 $= -54$

(iii) $(-7) \text{ by } (-2) = (-7) \times (-2)$
 $= 14$

(iv) $(7) \text{ by } (-10) = 7 \times (-10)$
 $= -70$

3. Use convenient groupings and find the value of :

(i) $8 \times (-27) \times 30$
 $= (-27) \times [8 \times 30]$
 $= (-27) \times 240$
 $= -6480$

(ii) $(-7) \times (-63) \times 9$
 $= [(-7) \times (-63)] \times 9$
 $= 441 \times 9$
 $= 3969$

(iii) $7 \times (-23) \times (-4)$
 $= 7 \times [(-23) \times (-4)]$
 $= 7 \times 92$
 $= 644$

(iv) $(-51) \times (-2) \times (-50)$
 $= [(-51) \times (-2)] \times (-50)$
 $= 102 \times (-50)$
 $= -5100$

4. Verify the following :

(i) $18 \times [9 + (-7)] = 18 \times 9 + 18 \times (-7)$
 $\Rightarrow 18 \times 9 + 18 \times (-7) = 18 \times 9 + 18 \times (-7)$
 $162 + (-126) = 162 + (-126)$
 $162 - 126 = 162 - 126$
 $36 = 36$

(ii) $(-13) \times [(-6) + (-19)] = (-13) \times (-6) + (-13) \times (-19)$
 $\Rightarrow (-13) \times (-6) + (-13) \times (-19) = (-13) \times (-6) + (-13) \times (-19)$
 $78 + 247 = 78 + 247$
 $325 = 325$

5. Simplify :

(i) $(-9) \times 6 + (-9) \times 4 = (-9) \times [6 + 4]$
 $= (-9) \times 10 = -90$

(ii) $(-27) \times (-16) + (-27) \times (-14)$
 $= (-27) \times [(-16) + (-14)]$
 $= (-27) \times (-30) = 810$

EXERCISE- 3C

1. Divide :

(i) $(-72) \div (-12)$

$$\Rightarrow (-72) \div (-12) = \frac{-72}{-12}$$
$$= +6$$

(ii) $80 \div (-16)$

$$\Rightarrow 80 \div (-16) = \frac{80}{-16}$$
$$= -5$$

(iii) $(-150) \div 15$

$$\Rightarrow (-150) \div 15 = \frac{-150}{15}$$
$$= -10$$

(iv) $2041 \div (-1)$

$$\Rightarrow 2041 \div (-1) = \frac{2041}{-1}$$
$$= -2041$$

2. Fill in the blanks :

(i) $70 \div (\dots) = -7$

$$\text{Required number} = 70 \div (-7) = \frac{70}{-7} = -10$$

(ii) $(\dots) \div 850 = 0$

$$\text{Required number} = 850 \times 0 = 0$$

(iii) $(15625) \div (-125) = \dots$

$$\text{Required number} = 15625 \div (-125) = \frac{15625}{-125} = -125$$

(iv) $(\dots) \div (-1) = 2550$

$$\text{Required number} = 2550 \times (-1) = -2550$$

3. Write "T" for True and "F" for False for each of the following statements:

(i) $(-25) \div (-25) = -1$

Ans. False

(ii) $(-24) \div 1 = -24$

Ans. True

(iii) $27 \div (-9) = 3$

Ans. False

(iv) $0 \div (-5) = 0$

Ans. True

MULTIPLE CHOICE QUESTIONS

1. The whole number which is not a natural number is 0.

Hence, the correct option is (a).

2. Multiplicative identity for whole number is 1.

Hence, the correct option is (c).

3. The value of $4137 \times 1780 - 4137 \times 780$ is 4137000.

Hence, the correct option is (a).

4. $36 \div (-9) = -4$

Hence, the correct option is (a).

5. $6 - (-4) = 6 + 4 = 10$

Hence, the correct option is (b).

6. The additive inverse of -5 is 5 .

Hence, the correct option is (a).

7. On subtracting 8 from -4 , we get $-4 - 8 = -12$

Hence, the correct option is (d).

8. The sum of two integers is -25 . If one of them is 30 , find the other is -55 .

Hence, the correct option is (a).

9. $(-9) \times 6 + (-9) \times 4 = -54 - 36 = -90$

Hence, the correct option is (a).

10. 2 Less than -7 is $-7 - 2 = -9$

Hence, the correct option is (a).



Playing with Numbers



EXERCISE- 4A

1. Write down all the factors of :

(i) 14

We know that, $14 = 1 \times 14$

$$14 = 2 \times 7$$

So, $1, 2, 7$ and 14 are all factors of 14 .

(ii) 36

We know that, $36 = 1 \times 36$

$$36 = 2 \times 18$$

$$36 = 3 \times 12$$

$$36 = 4 \times 9$$

$$36 = 6 \times 6$$

So, $1, 2, 3, 4, 6, 9, 12, 18$ and 36 are all factors of 36 .

(iii) 60

We know that, $60 = 1 \times 60$

$$60 = 2 \times 30$$

$$60 = 3 \times 20$$

$$60 = 4 \times 15$$

$$60 = 5 \times 12$$

$$60 = 6 \times 10$$

So, 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60 are all factors of 60.

(iv) 75

We know that, $75 = 1 \times 75$

$$75 = 3 \times 25$$

$$75 = 5 \times 15$$

So, 1, 3, 5, 15, 25 and 75 are all factors of 75.

2. Write the first five multiples of each of the following numbers.

(i) 17

The first five multiples of 17

$$\Rightarrow 17 \times 1 = 17 ; 17 \times 2 = 34 ; 17 \times 3 = 51 ; 17 \times 4 = 68 ; 17 \times 5 = 85$$

(ii) 15

The first five multiples of 15

$$\Rightarrow 15 \times 1 = 15 ; 15 \times 2 = 30 ; 15 \times 3 = 45 ; 15 \times 4 = 60 ; 15 \times 5 = 75$$

(iii) 25

The first five multiples of 25

$$\Rightarrow 25 \times 1 = 25 ; 25 \times 2 = 50 ; 25 \times 3 = 75 ; 25 \times 4 = 100 ; 25 \times 5 = 125$$

(iv) 70

The first five multiples of 70

$$\Rightarrow 70 \times 1 = 70 ; 70 \times 2 = 140 ; 70 \times 3 = 210 ; 70 \times 4 = 280 ;$$

$$70 \times 5 = 350$$

3. State the following as prime or composite :

(i) 17 = **Prime number**

(ii) 23 = **Prime number**

(iii) 63 = **Composite number**

(iv) 91 = **Composite number**

4. Write all the prime numbers between :

(i) 30 and 40

The prime numbers between 30 and 40 = 31, 37

(ii) 40 and 80

The prime numbers between 40 and 80

$$= 41, 43, 47, 53, 59, 61, 67, 71, 73, 79$$

(iii) 80 and 100

The prime numbers between 80 and 100 = 83, 89 and 97

(iv) 10 and 40

The prime numbers between 10 and 40 = 11, 13, 17, 19, 23, 29, 31, 37

5. Express each of the following numbers as the sum of two odd primes:

(i) 98

$$\text{Sum of two odd primes} = 79 + 19 = 98$$

(ii) 84

$$\text{Sum of two odd primes} = 67 + 17 = 84$$

(iii) 42

$$\text{Sum of two odd primes} = 37 + 5 = 42$$

(iv) 36

$$\text{Sum of two odd primes} = 29 + 7 = 36$$

6. Express each of the following odd numbers as the sum of three odd prime numbers:

(i) 63

$$\text{Sum of three odd prime numbers} = 7 + 13 + 43 = 63$$

(ii) 31

$$\text{Sum of three odd prime numbers} = 5 + 7 + 19 = 31$$

(iii) 35

$$\text{Sum of three odd prime numbers} = 5 + 7 + 23 = 35$$

(iv) 49

$$\text{Sum of three odd prime numbers} = 3 + 5 + 41 = 49$$

7. Express the given numbers as the sum of three different primes :

(i) 51

$$\therefore 51 = 41 + 7 + 3$$

(ii) 60

$$\therefore 60 = 47 + 11 + 2$$

(iii) 41

$$\therefore 41 = 31 + 7 + 3$$

(iv) 19

$$\therefore 19 = 11 + 5 + 3$$

EXERCISE-4B

1. Test the divisibility of the following numbers by 2 :

(i) 250

A number is divisible by 2 if its ones digit is 0, 2, 4, 6, 8.

\therefore 250 is divisible by 2.

(ii) 281

A number is divisible by 2 if its ones digit is 0, 2, 4, 6, 8.

\therefore 281 is not divisible by 2.

(iii) 59628

A number is divisible by 2 if its ones digit is 0, 2, 4, 6, 8.

\therefore 59628 is divisible by 2.

(iv) 789403

A number is divisible by 2 if its ones digit is 0, 2, 4, 6, 8.

\therefore 789403 is not divisible by 2.

2. Test the divisibility of the following numbers by 3 :

(i) 2424

A number is divisible by 3 if the sum of its digits is divisible by 3.

\therefore 2424 is divisible by 3.

(ii) 181824

A number is divisible by 3 if the sum of its digits is divisible by 3.

\therefore 181824 is divisible by 3.

(iii) 20171

A number is divisible by 3 if the sum of its digits is divisible by 3.

\therefore 20171 is not divisible by 3.

(iv) 19827

A number is divisible by 3 if the sum of its digits is divisible by 3.

\therefore 19827 is divisible by 3.

3. Test the divisibility of the following numbers by 4 :

(i) 618

A number is divisible by 4 if the number formed by its digits in the tens and ones places is divisible by 4.

\therefore 618 is not divisible by 4.

(ii) 2314

A number is divisible by 4 if the number formed by its digits in the tens and ones places is divisible by 4.

\therefore 2314 is not divisible by 4.

(iii) 63712

A number is divisible by 4 if the number formed by its digits in the tens and ones places is divisible by 4.

\therefore 63712 is divisible by 4.

(iv) 84255

A number is divisible by 4 if the number formed by its digits in the tens and ones places is divisible by 4.

\therefore 84255 is not divisible by 4.

4. Test the divisibility of the following numbers by 5 :

(i) 1050

If the ones digit of a number is 0 or 5, then the number is divisible by 5.

\therefore 1050 is divisible by 5.

(ii) 24680

If the ones digit of a number is 0 or 5, then the number is divisible by 5.

\therefore 24680 is divisible by 5.

(iii) 23309

If the ones digit of a number is 0 or 5, then the number is divisible by 5.

\therefore 23309 is not divisible by 5.

(iv) 48432

If the ones digit of a number is 0 or 5, then the number is divisible by 5.

\therefore 48432 is not divisible by 5.

5. Test the divisibility of the following numbers by 6 :

(i) 60161

60161 is not divisible by both 2 and 3.

\therefore 60161 is not divisible by 6.

(ii) 16240

16240 is divisible by 2 but not by 3.

\therefore 16240 is not divisible by 6.

(iii) 26640

26640 is divisible by both 2 and 3.

\therefore 26640 is divisible by 6.

(iv) 2420

2420 is divisible by 2 but not by 3.

\therefore 2420 is not divisible by 6.

6. Test the divisibility of the following numbers by 7 :

(i) 1470

A number is divisible by 7 if the difference between twice the ones digit and the number formed by the other digits is either 0 or a multiple of 7.

\therefore 1470 is divisible by 7.

(ii) 45781

A number is divisible by 7 if the difference between twice the ones digit and the number formed by the other digits is either 0 or a multiple of 7.

\therefore 45781 is not divisible by 7.

(iii) 4280

A number is divisible by 7 if the difference between twice the ones digit and the number formed by the other digits is either 0 or a multiple of 7.

\therefore 4280 is not divisible by 7.

(iv) 141407

A number is divisible by 7 if the difference between twice the ones digit and the number formed by the other digits is either 0 or a multiple of 7.

\therefore 141407 is divisible by 7.

7. Test the divisibility of the following numbers by 8 :

(i) 6394

In 6394, 394 is not divisible by 8.

\therefore 6394 is not divisible by 8.

(ii) 19720

In 19720, 720 is divisible by 8.

\therefore 19720 is divisible by 8.

(iii) 7272

In 7272, 272 is divisible by 8.

\therefore 7272 is divisible by 8.

(iv) 646432

In 646432, 432 is divisible by 8.

\therefore 646432 is divisible by 8.

8. Test the divisibility of the following numbers by 9 :

(i) 72720

Sum of digits = $7 + 2 + 7 + 2 + 0 = 18$,

which is divisible by 9.

\therefore 72720 is divisible by 9.

(ii) 818172

Sum of digits = $8 + 1 + 8 + 1 + 7 + 2 = 27$,

which is divisible by 9.

\therefore 818172 is divisible by 9.

(iii) 920

Sum of digits = $9 + 2 + 0 = 11$,

which is not divisible by 9.

\therefore 920 is not divisible by 9.

(iv) 19999

Sum of digits = $1 + 9 + 9 + 9 + 9 = 37$,

which is not divisible by 9.

\therefore 19999 is not divisible by 9.

9. Test the divisibility of the following numbers by 10 :

(i) 7200

7200 has 0 in its ones
places.

\therefore 7200 is divisible by 10.

(ii) 15509

15509 has 9 in its ones
places.

\therefore 15509 is not divisible by 10.

(iii) 909080

909080 has 0 in its ones places.

\therefore 909080 is divisible by 10.

10. Test the divisibility of the following numbers by 11 :

(i) 1331,

In 1331, Sum of digits in odd places = $1 + 3 = 4$

Sum of digits in even places = $1 + 3 = 4$

Difference of the two sums = $4 - 4 = 0$

\therefore 1331 is divisible by 11.

(ii) 59892

In 59892, Sum of digits in odd places = $5 + 9 + 9 = 23$

Sum of digits in even places = $8 + 2 = 10$

Difference of the two sums = $23 - 10 = 13$

\therefore 59892 is not divisible by 11.

(iii) 63333

In 63333, Sum of digits in odd places = $3 + 3 + 3 + 3 = 12$

Sum of digits in even places = $6 + 0 = 6$

Difference of the two sums = $12 - 6 = 6$

\therefore 63333 is not divisible by 11.

(iv) 137269

In 137269, Sum of digits in odd places = $1 + 3 + 7 + 9 = 20$

Sum of digits in even places = $1 + 2 + 6 = 9$

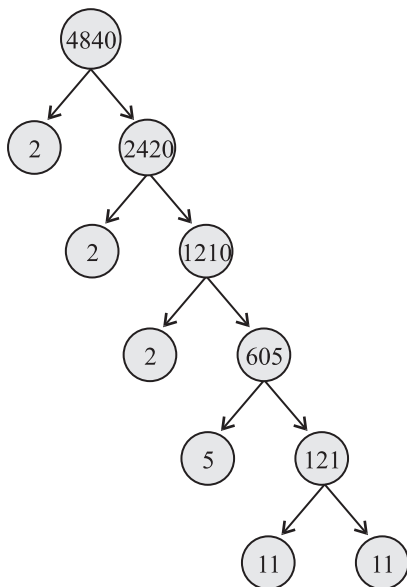
Difference of the two sums = $20 - 9 = 11$

\therefore 137269 is divisible by 11.

EXERCISE- 4C

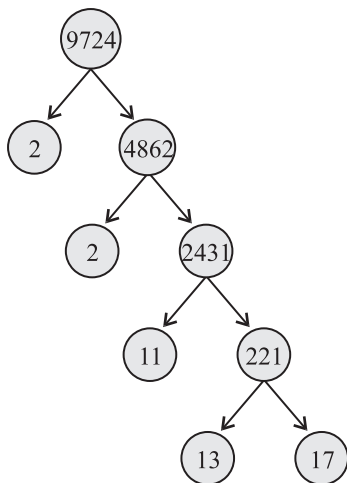
1. Find prime factorization by tree method of the following numbers :

(i) 4840



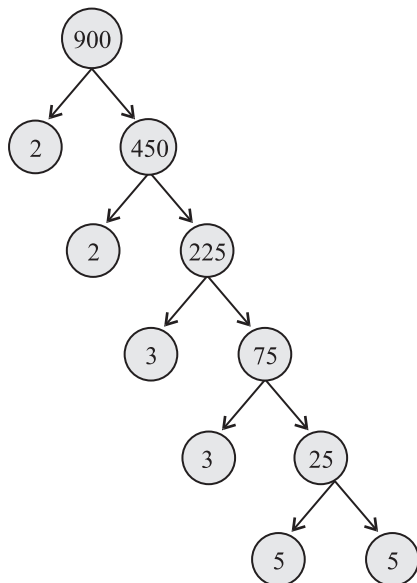
$$\therefore 4840 = 2 \times 2 \times 2 \times 5 \times 11 \times 11$$

(ii) 9724



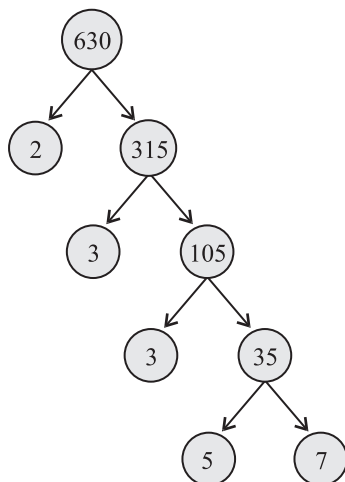
$$\therefore 9724 = 2 \times 2 \times 11 \times 13 \times 17$$

(iii) 900



$$\therefore 900 = 2 \times 2 \times 3 \times 3 \times 5 \times 5$$

(iv) 630



$$\therefore 630 = 2 \times 3 \times 3 \times 5 \times 7$$

2. Find prime factorization by division method of the following numbers:

(i) 1728

$$\begin{array}{r|l}
 2 & 1728 \\
 2 & 864 \\
 2 & 432 \\
 2 & 216 \\
 2 & 108 \\
 2 & 54 \\
 3 & 27 \\
 3 & 9 \\
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\begin{aligned}
 \therefore 1728 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\
 &\quad \times 3 \times 3 \times 3 \\
 &= 2^6 \times 3^3
 \end{aligned}$$

(ii) 3200

$$\begin{array}{r|l}
 2 & 3200 \\
 2 & 1600 \\
 2 & 800 \\
 2 & 400 \\
 2 & 200 \\
 2 & 100 \\
 2 & 50 \\
 5 & 25 \\
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

$$\begin{aligned}
 \therefore 3200 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\
 &\quad \times 2 \times 5 \times 5 \\
 &= 2^7 \times 5^2
 \end{aligned}$$

(iii) 1250

$$\begin{array}{r|l}
 2 & 1250 \\
 5 & 625 \\
 5 & 125 \\
 5 & 25 \\
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

$$\begin{aligned}
 \therefore 1250 &= 2 \times 5 \times 5 \times 5 \times 5 \\
 &= 2 \times 5^4
 \end{aligned}$$

(iv) 729

$$\begin{array}{r|l}
 3 & 729 \\
 3 & 243 \\
 3 & 81 \\
 3 & 27 \\
 3 & 9 \\
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\begin{aligned}
 \therefore 729 &= 3 \times 3 \times 3 \times 3 \times 3 \times 3 \\
 &= 3^6
 \end{aligned}$$

EXERCISE- 4D

1. Find the HCF of the numbers in each of the following, using the prime factorization and Tree Method:

(i) 84, 98

Prime Factorization

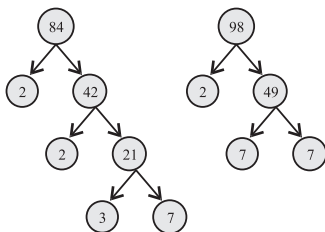
$$\begin{array}{r|l}
 2 & 84 \\
 2 & 42 \\
 3 & 21 \\
 7 & 7 \\
 \hline
 & 1
 \end{array}
 \quad
 \begin{array}{r|l}
 2 & 98 \\
 7 & 49 \\
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

$$\therefore 84 = 2 \times 2 \times 3 \times 7$$

$$98 = 2 \times 7 \times 7$$

$$\begin{aligned}
 \therefore \text{HCF of } 84 \text{ and } 98 \\
 &= 2 \times 7 = 14
 \end{aligned}$$

Tree Method :



$$\therefore 84 = 2 \times 2 \times 3 \times 7$$

$$98 = 2 \times 7 \times 7$$

$$\therefore \text{HCF of } 84 \text{ and } 98 = 2 \times 7 = 14$$

(ii) 72, 108, 180

Prime Factorization

2	72	2	108	2	180
2	36	2	54	2	90
2	18	3	27	3	45
3	9	3	9	3	15
3	3	3	3	5	5
	1		1		1

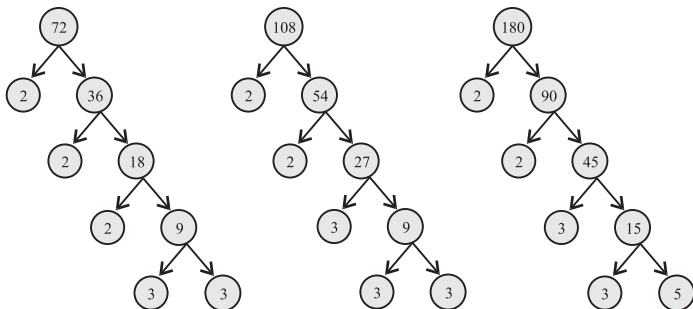
$$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5$$

$$\therefore \text{HCF of 72, 108 and 180} = 2 \times 2 \times 3 \times 3 = 36$$

Tree Method :



$$\therefore 72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5$$

$$\therefore \text{HCF of 72, 108 and 180} = 2 \times 2 \times 3 \times 3 = 36$$

(iii) 504, 980

Prime Factorization

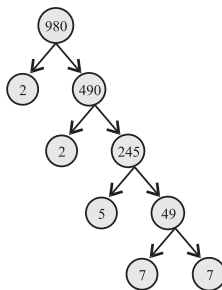
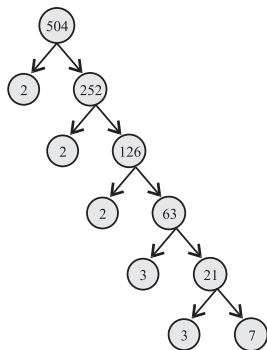
2	504	2	980
2	252	2	490
2	126	5	245
3	63	7	49
3	21	7	7
7	7		1
	1		

$$\therefore 504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7$$

$$980 = 2 \times 2 \times 5 \times 7 \times 7$$

$$\therefore \text{HCF of 504 and 980} = 2 \times 2 \times 7 = 28$$

Tree Method :



$$\therefore 504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7$$

$$\therefore 980 = 2 \times 2 \times 5 \times 7 \times 7$$

$$\therefore \text{HCF of } 504 \text{ and } 980 = 2 \times 2 \times 7 = 28$$

2. Find the HCF of the numbers in each of the following, using the division method:

- (i) 58, 70

$$\begin{array}{r}
 58 \overline{) 70} (1 \\
 \underline{-58} \\
 12 \overline{) 58} (4 \\
 \underline{-48} \\
 10 \overline{) 12} (1 \\
 \underline{-10} \\
 2 \overline{) 10} (5 \\
 \underline{-10} \\
 \hline
 \times
 \end{array}$$

Hence, the clearly HCF of the given two numbers 58 and 70 is 2.

- (ii) 1965, 2096

$$\begin{array}{r}
 1965 \overline{) 2096} (1 \\
 \underline{-1965} \\
 131 \overline{) 1965} (15 \\
 \underline{-131} \\
 655 \\
 \underline{-655} \\
 \hline
 \times
 \end{array}$$

Hence, the clearly HCF of the given two numbers 1965 and 2096 is 131.

(ii) 1045, 1520

$$\begin{array}{r}
 1045 \overline{)1520} (1 \\
 \underline{-1045} \\
 475 \overline{)1045} (2 \\
 \underline{-950} \\
 95 \overline{)475} (5 \\
 \underline{-475} \\
 \hline
 \times
 \end{array}$$

Hence, the clearly HCF of the given two numbers 1045 and 1520 is 95.

3. Show that the following pairs are co-primes:

(i) 59, 97

$$59 = \boxed{1} \times 59$$

$$97 = \boxed{1} \times 97$$

Common factor is 1 only here.

So, 59 and 97 are co-primes as their HCF is 1.

(ii) 161, 192

$$161 = \boxed{1} \times 7 \times 23$$

$$192 = \boxed{1} \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

Common factor is 1 only here. So, 161 and 192 are co-primes as their HCF is 1.

(iii) 343, 432

$$343 = \boxed{1} \times 7 \times 7 \times 7$$

$$432 = \boxed{1} \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

Common factor is 1 only here. So, 161 and 192 are co-primes as their HCF is 1.

EXERCISE- 4E

1. Length of rectangular park = 18 m 72 cm = 1872 cm (\because 1 m = 100 cm)

Width of rectangular park = 13 m 20 cm = 1320 cm

Area of rectangular park = length \times width

$$= 1872 \times 1320$$

$$= 2471040 \text{ cm}^2$$

HCF of 2471040

2	2471040
2	1235520
2	617760
2	308880
2	154440
2	77220
2	38610
3	19305
3	6435
3	2145
5	715
11	143
13	13
	1

$$\therefore 2471040 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 11 \times 13$$

$$\therefore \text{HCF of } 2471040 = 2 \times 2 \times 2 \times 3 = 24$$

$$\text{Side of a tile} = 24 \text{ cm}$$

$$\text{Area of square tile} = 24 \text{ cm} \times 24 \text{ cm}$$

$$= 576 \text{ cm}^2$$

$$\text{Number of tiles} = \frac{\text{Area of rectangular park}}{\text{Area of square tile}}$$

$$= \frac{2471040 \text{ cm}^2}{576 \text{ cm}^2} = 4290 \text{ tiles}$$

2. Clearly, we must find the greatest number which divides $(615 - 6 = 609)$ and $(963 - 6 = 957)$ exactly.

So, the required number = HCF of 609 and 957

$$\begin{array}{r} 609 \overline{) 957} 1 \\ \underline{-609} \\ 348 \overline{) 609} 1 \\ \underline{-348} \\ 261 \overline{) 348} 1 \\ \underline{-261} \\ 87 \overline{) 261} 3 \\ \underline{-261} \\ \times \end{array}$$

Hence, the required number is 87.

3. Clearly, we must find the greatest number which divides $(445 - 4 = 441)$, $(572 - 5 = 567)$ and $(699 - 6 = 693)$ exactly.

So, the required number = HCF of 441, 567 and 693

$$\begin{array}{r} 441 \overline{) 567} 1 \\ \underline{-441} \\ 126 \overline{) 441} 3 \\ \underline{-378} \\ 63 \overline{) 126} 2 \\ \underline{-126} \\ \times \end{array} \quad \begin{array}{r} 63 \overline{) 693} 11 \\ \underline{-63} \\ 63 \\ \underline{-63} \\ \times \end{array}$$

Hence, the required number is 63.

4. Reduce each of the following fractions to the lowest terms :

(i) $\frac{161}{207}$

For, reducing the given fraction to the lowest terms, we divide its numerator and the denominator by their HCF.

Now, we find the HCF of 161 and 207 as under.

$$\begin{array}{r}
 161 \overline{) 207} 1 \\
 \underline{-161} \\
 46 \overline{) 161} 3 \\
 \underline{-138} \\
 23 \overline{) 46} 2 \\
 \underline{-46} \\
 \times
 \end{array}$$

Hence, HCF of 161 and 207 is 23.

Now, dividing the numerator and the denominator of the given fraction by 23, we get

$$\frac{161 \div 23}{207 \div 23} = \frac{7}{9}$$

(ii) $\frac{296}{481}$

For, reducing the given fraction to the lowest terms, we divide its numerator and the denominator by their HCF.

Now, we find the HCF of 296 and 481 as under.

$$\begin{array}{r}
 296 \overline{) 481} 1 \\
 \underline{-296} \\
 185 \overline{) 296} 1 \\
 \underline{-185} \\
 111 \overline{) 185} 1 \\
 \underline{-111} \\
 74 \overline{) 111} 1 \\
 \underline{-74} \\
 37 \overline{) 74} 2 \\
 \underline{-74} \\
 \times
 \end{array}$$

Hence, HCF of 296 and 481 is 37.

Now, dividing the numerator and the denominator of the given fraction by 37.

$$\frac{296 \div 37}{481 \div 37} = \frac{8}{13}$$

EXERCISE- 4F

1. Find the LCM of the following numbers by prime factorization method:

(i) 175, 65, 120, 100

$$\begin{array}{r|l} 5 & 175 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 5 & 65 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 120 \\ \hline 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{aligned} \therefore \quad 175 &= 5 \times 5 \times 7 \\ 65 &= 5 \times 13 \\ 120 &= 2 \times 2 \times 2 \times 3 \times 5 \\ 100 &= 2 \times 2 \times 5 \times 5 \end{aligned}$$

Therefore, the LCM of the given numbers

$$= 2 \times 2 \times 2 \times 5 \times 5 \times 3 \times 7 \times 13 = 54600$$

(ii) 125, 64, 8, 3

$$\begin{array}{r|l} 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{aligned} \therefore \quad 125 &= 5 \times 5 \times 5 \\ 64 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ 8 &= 2 \times 2 \times 2 \\ 3 &= 3 \times 1 \end{aligned}$$

Therefore, the LCM of the given numbers

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 5 = 24000$$

(iii) 72, 108, 180

$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 180 \\ \hline 2 & 90 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{aligned} \therefore \quad 72 &= 2 \times 2 \times 2 \times 3 \times 3 \\ 108 &= 2 \times 2 \times 3 \times 3 \times 3 \\ 180 &= 2 \times 2 \times 3 \times 3 \times 5 \end{aligned}$$

Therefore, the LCM of the given numbers

$$= 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 = 1080$$

(iv) 30, 46, 12

2	30	2	46	2	12
3	15	23	23	2	6
5	5		1	3	3
	1				1

$$\therefore 30 = 2 \times 3 \times 5$$

$$46 = 2 \times 23$$

$$12 = 2 \times 2 \times 3$$

Therefore, the LCM of the given numbers

$$= 2 \times 2 \times 3 \times 5 \times 23 = 1380$$

2. Find the LCM of the following numbers by division method :

(i) 30, 60, 12

2	30,	60,	12
2	15,	30,	6
3	15,	15,	3
5	5,	5,	1
	1,	1,	1

Hence, the LCM of the given numbers = $2 \times 2 \times 3 \times 5 = 60$

(ii) 15, 12, 28

2	15,	12,	28
2	15,	6,	14
3	15,	3,	7
5	5,	1,	7
7	1,	1,	7
	1,	1,	1

Hence, the LCM of the given numbers = $2 \times 2 \times 3 \times 5 \times 7 = 420$

(iii) 700, 420, 1120

2	700,	420,	1120
2	350,	210,	560
2	175,	105,	280
2	175,	105,	140
2	175,	105,	70
5	175,	105,	35
5	35,	21,	7
3	7,	21,	7
7	7,	7,	7
	1,	1,	1

Hence, the LCM of the given numbers

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7 = 16800$$

EXERCISE- 4G

1. Product of two numbers = 2160

Their HCF = 12

$$\text{LCM} = \frac{\text{Product of numbers}}{\text{HCF}} = \frac{2160}{12}$$

$$\text{LCM} = 180$$

2. Product of two numbers = 2560

Their LCM = 320

$$\text{HCF} = \frac{\text{Product of numbers}}{\text{LCM}} = \frac{2560}{320}$$

$$\text{HCF} = 8$$

3. HCF of two numbers = 145

LCM of two numbers = 2175

One number = 725

$$\begin{aligned} \text{Other number} &= \frac{\text{HCF} \times \text{LCM}}{\text{One number}} \\ &= \frac{145 \times 2175}{725} = 435 \end{aligned}$$

4. For each pair of numbers, verify that their product = HCF \times LCM.

- (i) 87, 145

$$\text{Product of numbers} = 87 \times 145 = 12615$$

Now, we find LCM and HCF of the given numbers,

$$\text{HCF of 87 and 145} = 29$$

$$\begin{aligned} \text{LCM of 87 and 145} &= 3 \times 5 \times 29 \\ &= 435 \end{aligned}$$

$$\begin{aligned} \text{Now, HCF} \times \text{LCM} &= 29 \times 435 \\ &= 12615 \end{aligned}$$

= Product of numbers

3	87,	145
5	29,	145
29	29,	29
	1,	1

- (ii) 186, 403

$$\text{Product of numbers} = 186 \times 403 = 74958$$

Now, we find HCF and LCM of given numbers,

$$\text{HCF of 186 and 403} = 31$$

$$\text{LCM of 186 and 403} = 2 \times 3 \times 13 \times 31 = 2418$$

$$\begin{aligned} \text{Now, HCF} \times \text{LCM} &= 31 \times 2418 \\ &= 74958 \end{aligned}$$

= Product of numbers

2	186,	403
3	93,	403
13	31,	403
31	31,	31
	1,	1

MULTIPLE CHOICE QUESTIONS

1. 179 is a prime number.
Hence, the correct option is (c).
2. 9, 10 are co-primes.
Hence, the correct option is (b).
3. 32 is a composite number.
Hence, the correct option is (c).
4. HCF of 144 and 198 is 18.
Hence, the correct option is (d).
5. $\frac{289}{391}$ when reduced to the lowest terms is $\frac{17}{23}$.
Hence, the correct option is (d).
6. The greatest number which divides 134 and 167 leaving 2 as remainder in each case is 33.
Hence, the correct option is (d).
7. The LCM of 24, 36, 40 is 360.
Hence, the correct option is (c).
8. 83479560 is divisible by 3.
Hence, the correct option is (c).
9. 87941032 is divisible by 4.
Hence, the correct option is (d).
10. 22222222 is divisible by 11.
Hence, the correct option is (a).
11. (d)
12. Divisible by each of the numbers 15, 20, 24, 32 and 36 is 1440.
Hence, the correct option is (c).
13. The HCF of two numbers is 145 and their LCM is 2175. If one of the numbers is 725, the other number is 435.
Hence, the correct option is (b).
14. The product of two numbers is 2160 and their HCF is 12. The LCM of these numbers is 180.
Hence, the correct option is (c).
15. The HCF of two co-primes is 1.
Hence, the correct option is (c).



Fractions



EXERCISE- 5A

1. Write the fraction representing the shaded portion :

(i) $\frac{5}{8}$

(ii) $\frac{1}{4}$

(iii) $\frac{3}{8}$

(iv) $\frac{1}{2}$

2. Do yourself.

3. Write the first four equivalent fractions of the given fractions:

(i) $\frac{4}{5}$

$$\Rightarrow \frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10}; \quad \frac{4}{5} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$$

$$\frac{4}{5} = \frac{4 \times 4}{5 \times 4} = \frac{16}{20}; \quad \frac{4}{5} = \frac{4 \times 5}{5 \times 5} = \frac{20}{25}$$

Thus, $\frac{8}{10}$, $\frac{12}{15}$, $\frac{16}{20}$ and $\frac{20}{25}$ are equivalent fractions of $\frac{4}{5}$.

(ii) $\frac{6}{7}$

$$\Rightarrow \frac{6}{7} = \frac{6 \times 2}{7 \times 2} = \frac{12}{14}; \quad \frac{6}{7} = \frac{6 \times 3}{7 \times 3} = \frac{18}{21}$$

$$\frac{6}{7} = \frac{6 \times 4}{7 \times 4} = \frac{24}{28}; \quad \frac{6}{7} = \frac{6 \times 5}{7 \times 5} = \frac{30}{35}$$

Thus, $\frac{12}{14}$, $\frac{18}{21}$, $\frac{24}{28}$ and $\frac{30}{35}$ are equivalent fractions of $\frac{6}{7}$.

(iii) $\frac{9}{12}$

$$\Rightarrow \frac{9}{12} = \frac{9 \times 2}{12 \times 2} = \frac{18}{24}; \quad \frac{9}{12} = \frac{9 \times 3}{12 \times 3} = \frac{27}{36}$$

$$\frac{9}{12} = \frac{9 \times 4}{12 \times 4} = \frac{36}{48}; \quad \frac{9}{12} = \frac{9 \times 5}{12 \times 5} = \frac{45}{60}$$

Thus, $\frac{18}{24}$, $\frac{27}{36}$, $\frac{36}{48}$ and $\frac{45}{60}$ are equivalent fractions of $\frac{9}{12}$.

(iv) $\frac{15}{20}$

$$\Rightarrow \frac{15}{20} = \frac{15 \times 2}{20 \times 2} = \frac{30}{40}; \quad \frac{15}{20} = \frac{15 \times 3}{20 \times 3} = \frac{45}{60}$$

$$\frac{15}{20} = \frac{15 \times 4}{20 \times 4} = \frac{60}{80}; \quad \frac{15}{20} = \frac{15 \times 5}{20 \times 5} = \frac{75}{100}$$

Thus, $\frac{30}{40}$, $\frac{45}{60}$, $\frac{60}{80}$ and $\frac{75}{100}$ are equivalent fractions of $\frac{15}{20}$.

4. Reduce the given fractions into their simplest form :

(i) $\frac{16}{24}$

HCF of 16 and 24 is 8.

$$\frac{16}{24} = \frac{16 \div 8}{24 \div 8} = \frac{2}{3}$$

Now, 2 and 3 have no common factor except 1.

Hence, $\frac{2}{3}$ is in the simplest form.

(ii) $\frac{10}{50}$

HCF of 10 and 50 is 10.

$$\frac{10}{50} = \frac{10 \div 10}{50 \div 10} = \frac{1}{5}$$

Now, 1 and 5 have no common factor except 1.

Hence, $\frac{1}{5}$ is in the simplest form.

(iii) $\frac{18}{72}$

HCF of 18 and 72 is 18.

$$\frac{18}{72} = \frac{18 \div 18}{72 \div 18} = \frac{1}{4}$$

Now, 1 and 4 have no common factor except 1.

Hence, $\frac{1}{4}$ is in the simplest form.

(iv) $\frac{32}{48}$

HCF of 32 and 48 is 16.

$$\frac{32}{48} = \frac{32 \div 16}{48 \div 16} = \frac{2}{3}$$

Now, 2 and 3 have no common factor except 1.

Hence, $\frac{2}{3}$ is in the simplest form.

5. Check whether the given fractions are equivalent :

(i) $\frac{9}{30}$ and $\frac{2}{16}$

$$\Rightarrow \frac{9}{30} \text{ and } \frac{2}{16}$$

$$9 \times 16 \text{ and } 30 \times 2$$

$$\therefore 144 \neq 60$$

Hence, $\frac{9}{30}$ and $\frac{2}{16}$ are not equivalent fractions.

(ii) $\frac{6}{9}$ and $\frac{12}{48}$

$$\Rightarrow \frac{6}{9} \text{ and } \frac{12}{48}$$

$$6 \times 48 \text{ and } 9 \times 12$$

$$\therefore 288 \neq 108$$

Hence, $\frac{6}{9}$ and $\frac{12}{48}$ are not equivalent fractions.

(iii) $\frac{4}{9}$ and $\frac{8}{18}$

$$\Rightarrow \frac{4}{9} \text{ and } \frac{8}{18}$$

$$4 \times 18 \text{ and } 9 \times 8$$

$$\therefore 72 = 72$$

Hence, $\frac{4}{9}$ and $\frac{8}{18}$ are equivalent fractions.

(iv) $\frac{13}{13}$ and $\frac{9}{21}$

$$\Rightarrow \frac{13}{13} \text{ and } \frac{9}{21}$$

$$13 \times 21 \text{ and } 13 \times 9$$

$$\therefore 273 \neq 117$$

Hence, $\frac{13}{13}$ and $\frac{9}{21}$ are not equivalent fractions.

6. Write the following in the ascending order :

(i) $\frac{2}{5}, \frac{7}{10}, \frac{11}{15}, \frac{17}{30}$

We find the LCM of the given denominators.

$$\therefore \text{LCM of } 5, 10, 15 \text{ and } 30 = 30$$

Write the given fractions with denominator as the LCM obtained.
Compare the like fractions.

$$\begin{aligned}\frac{2}{5} &= \frac{2 \times 6}{5 \times 6} = \frac{12}{30} \\ \frac{7}{10} &= \frac{7 \times 3}{10 \times 3} = \frac{21}{30} \\ \frac{11}{15} &= \frac{11 \times 2}{15 \times 2} = \frac{22}{30} \\ \frac{17}{30} &= \frac{17 \times 1}{30 \times 1} = \frac{17}{30}\end{aligned}$$

By arranging in ascending order, we get $\frac{12}{30}, \frac{17}{30}, \frac{21}{30}, \frac{22}{30}$. So, that is

$$\frac{2}{5}, \frac{17}{30}, \frac{7}{10}, \frac{11}{15}.$$

(ii) $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$

We find the LCM of the given denominators.

\therefore LCM of 2, 4, 6 and 8 = 24

Write the given fractions with denominator as the LCM obtained.
Compare the like fractions.

$$\begin{aligned}\frac{1}{2} &= \frac{1 \times 12}{2 \times 12} = \frac{12}{24} \\ \frac{3}{4} &= \frac{3 \times 6}{4 \times 6} = \frac{18}{24} \\ \frac{5}{6} &= \frac{5 \times 4}{6 \times 4} = \frac{20}{24} \\ \frac{7}{8} &= \frac{7 \times 3}{8 \times 3} = \frac{21}{24}\end{aligned}$$

By arranging in ascending order, we get $\frac{12}{24}, \frac{18}{24}, \frac{20}{24}, \frac{21}{24}$.

So, that is $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$.

EXERCISE- 5B

1. Solve the following :

(i) $\frac{2}{9} + \frac{5}{9}$

$$\Rightarrow \frac{2}{9} + \frac{5}{9} = \frac{2+5}{9} = \frac{7}{9}$$

(ii) $\frac{10}{15} + \frac{5}{15}$

$$\Rightarrow \frac{10}{15} + \frac{5}{15} = \frac{10+5}{15} = \frac{15}{15} = 1$$

$$(iii) \frac{3}{10} + \frac{5}{10}$$

$$\Rightarrow \frac{3}{10} + \frac{5}{10} = \frac{3+5}{10} = \frac{8}{10}$$

$$(iv) \frac{2}{3} + \frac{1}{4}$$

LCM of 3 and 4 is 12.

$$\text{Now, } \frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}; \frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

$$\therefore \frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{8+3}{12} = \frac{11}{12}$$

$$(v) 11\frac{1}{4} + 7\frac{3}{4} = \frac{45}{4} + \frac{31}{4} = \frac{45+31}{4} = \frac{76}{4} = 19$$

$$(vi) 3\frac{5}{6} + 7\frac{1}{6} = \frac{23}{6} + \frac{43}{6} = \frac{23+43}{6} = \frac{66}{6} = 11$$

$$(vii) 3\frac{1}{5} + 6\frac{16}{20} = \frac{16}{5} + \frac{136}{20}$$

LCM of 5 and 20 is 20.

$$\text{Now, } \frac{16}{5} = \frac{16 \times 4}{5 \times 4} = \frac{64}{20}; \frac{136}{20}$$

$$\therefore 3\frac{1}{5} + 6\frac{16}{20} = \frac{64}{20} + \frac{136}{20} = \frac{64+136}{20} = \frac{200}{20} = 10$$

$$(viii) 5\frac{2}{4} + 9\frac{1}{10} = \frac{22}{4} + \frac{91}{10}$$

LCM of 4 and 10 is 20.

$$\text{Now, } \frac{22}{4} = \frac{22 \times 5}{4 \times 5} = \frac{110}{20}; \frac{91}{10} = \frac{91 \times 2}{10 \times 2} = \frac{182}{20}$$

$$\begin{aligned} \therefore 5\frac{2}{4} + 9\frac{1}{10} &= \frac{110}{20} + \frac{182}{20} \\ &= \frac{110+182}{20} = \frac{292}{20} = \frac{73}{5} = 14\frac{3}{5} \end{aligned}$$

2. Solve the following :

$$(i) \frac{5}{8} - \frac{1}{8} \Rightarrow \frac{5}{8} - \frac{1}{8} = \frac{5-1}{8} = \frac{4}{8} = \frac{1}{2}$$

$$(ii) \frac{7}{12} - \frac{5}{12} \Rightarrow \frac{7}{12} - \frac{5}{12} = \frac{7-5}{12} = \frac{2}{12} = \frac{1}{6}$$

$$(iii) \frac{5}{9} - \frac{2}{9} \Rightarrow \frac{5}{9} - \frac{2}{9} = \frac{5-2}{9} = \frac{3}{9} = \frac{1}{3}$$

$$(iv) \frac{7}{8} - \frac{5}{12}$$

LCM of 8 and 12 is 24.

$$\text{Now, } \frac{7}{8} = \frac{7 \times 3}{8 \times 3} = \frac{21}{24}; \quad \frac{5}{12} = \frac{5 \times 2}{12 \times 2} = \frac{10}{24}$$

$$\therefore \frac{7}{8} - \frac{5}{12} = \frac{21}{24} - \frac{10}{24} = \frac{21-10}{24} = \frac{11}{24}$$

$$(v) 2\frac{3}{8} - 1\frac{3}{4} = \frac{19}{8} - \frac{7}{4}$$

LCM of 8 and 4 is 4.

$$\text{Now, } \frac{19}{8}; \quad \frac{7}{4} = \frac{7 \times 2}{4 \times 2} = \frac{14}{8}$$

$$\therefore 2\frac{3}{8} - 1\frac{3}{4} = \frac{19}{8} - \frac{14}{8} = \frac{19-14}{8} = \frac{5}{8}$$

$$(vi) 4\frac{1}{5} - \frac{7}{10} = \frac{21}{5} - \frac{7}{10}$$

LCM of 5 and 10 is 10.

$$\text{Now, } \frac{21}{5} = \frac{21 \times 2}{5 \times 2} = \frac{42}{10}; \quad \frac{7}{10}$$

$$\therefore 4\frac{1}{5} - \frac{7}{10} = \frac{42}{10} - \frac{7}{10} = \frac{42-7}{10} = \frac{35}{10} = \frac{7}{2} = 3\frac{1}{2}$$

$$(vii) 8 - 1\frac{5}{6} = \frac{8}{1} - \frac{11}{6}$$

LCM of 1 and 6 is 6.

$$\text{Now, } \frac{8}{1} = \frac{8 \times 6}{1 \times 6} = \frac{48}{6}; \quad \frac{11}{6}$$

$$\therefore 8 - 1\frac{5}{6} = \frac{48}{6} - \frac{11}{6} = \frac{48-11}{6} = \frac{37}{6} = 6\frac{1}{6}$$

$$(viii) 6\frac{1}{3} - 2\frac{2}{8} = \frac{19}{3} - \frac{18}{8}$$

LCM of 3 and 8 is 24.

$$\text{Now, } \frac{19}{3} = \frac{19 \times 8}{3 \times 8} = \frac{152}{24}; \quad \frac{18}{8} = \frac{18 \times 3}{8 \times 3} = \frac{54}{24}$$

$$\therefore 6\frac{1}{3} - 2\frac{2}{8} = \frac{152}{24} - \frac{54}{24} = \frac{152-54}{24} = \frac{98}{24} = \frac{49}{12} = 4\frac{1}{12}$$

EXERCISE- 5C

1. Part of book read by kirti = $\frac{30}{100} = \frac{3}{10}$

Part of book read by Damini = $\frac{2}{5} = \frac{2 \times 2}{5 \times 2} = \frac{4}{10}$

(Converting into equivalent fraction with denominator 10)

Clearly, $\frac{3}{10} < \frac{4}{10}$

$\therefore \frac{3}{10} < \frac{2}{5}$

Hence, Damini read more part of book.

2. Weight of empty gas cylinder = $16\frac{4}{5}$ kg

Weight of gas = $14\frac{2}{3}$ kg

Total weight of the cylinder filled with gas = $\left(16\frac{4}{5} + 14\frac{2}{3}\right)$ kg

$$= \left(\frac{84}{5} + \frac{44}{3}\right) \text{ kg} = \left(\frac{84 \times 3}{5 \times 3} + \frac{44 \times 5}{3 \times 5}\right) \text{ kg}$$

$$= \left(\frac{252}{15} + \frac{220}{15}\right) \text{ kg} = \frac{252 + 220}{15} \text{ kg}$$

$$= \frac{472}{15} \text{ kg} = 31\frac{7}{15} \text{ kg}$$

Hence, the weight of the cylinder filled with gas is $31\frac{7}{15}$ kg.

3. Distance covered by rickshaw = $4\frac{3}{4}$ km

Distance covered by foot = $1\frac{1}{2}$ km

Distance covered by Kartik = Distance between his house and school

$$= \left(4\frac{3}{4} + 1\frac{1}{2}\right) \text{ km} = \left(\frac{19}{4} + \frac{3}{2}\right) \text{ km}$$

$$= \left(\frac{19}{4} + \frac{3 \times 2}{2 \times 2}\right) \text{ km} = \left(\frac{19}{4} + \frac{6}{4}\right) \text{ km}$$

$$= \frac{19 + 6}{4} \text{ km} = \frac{25}{4} \text{ km} = 6\frac{1}{4} \text{ km}$$

Hence, distance of house from the school is $6\frac{1}{4}$ km.

4. Total length of wire $= 2\frac{3}{4}$ m

Length of one piece $= \frac{5}{8}$ m

Length of other piece $= \left(2\frac{3}{4} - \frac{5}{8}\right)$ m $= \left(\frac{11}{4} - \frac{5}{8}\right)$ m

$= \left(\frac{11 \times 2}{4 \times 2} - \frac{5}{8}\right)$ m $= \left(\frac{22}{8} - \frac{5}{8}\right)$ m $= \frac{22-5}{8}$ m $= \frac{17}{8}$ m $= 2\frac{1}{8}$ m

Hence, the length of other piece is $2\frac{1}{8}$ m.

5. Given, $\frac{3}{4}$ and $\frac{5}{7}$

$\frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28}$; $\frac{5}{7} = \frac{5 \times 4}{7 \times 4} = \frac{20}{28}$ (Since, 4 and 7 are co-primes.)

Clearly, $\frac{21}{28} > \frac{20}{28}$

$\therefore \frac{3}{4} > \frac{5}{7}$

Now, $\frac{3}{4} - \frac{5}{7} = \frac{21}{28} - \frac{20}{28} = \frac{21-20}{28} = \frac{1}{28}$

Hence, $\frac{3}{4}$ is greater by $\frac{1}{28}$.

MULTIPLE CHOICE QUESTIONS

1. A fraction equivalent to $\frac{24}{36}$ is $\frac{2}{3}$.

Hence, the correct option is (b).

2. If $\frac{3}{4}$ is equivalent to $\frac{x}{20}$ then the value of x is 15.

Hence, the correct option is (a).

3. If $\frac{45}{60}$ is equivalent to $\frac{3}{x}$ then the value of x is 4.

Hence, the correct option is (a).

4. (d) None of these

5. The largest of the fractions $\frac{4}{5}, \frac{4}{7}, \frac{4}{9}, \frac{4}{11}$ is $\frac{4}{5}$.

Hence, the correct option is (b).

6. $4\frac{3}{5} = \frac{23}{5}$

Hence, the correct option is (b).



Decimals



EXERCISE- 6A

1. Write the place value of the highlight digit in the following decimal numbers :

(i) **5**12.004

The place value of 5 is five hundreds or 500.

(ii) 8.**9**3

The place value of 9 is nine tenths or $\frac{9}{10}$.

(iii) 532.94**7**

The place value of 7 is seven thousandths or $\frac{7}{1000}$.

(iv) 20.0**6**5

The place value of 6 is six hundredths or $\frac{6}{100}$.

2. Write each of the following into decimal form :

(i) $40 + 6 + \frac{7}{10} + \frac{9}{100} = \mathbf{46.79}$

(ii) $500 + 70 + 8 + \frac{3}{10} + \frac{1}{100} + \frac{6}{1000} = \mathbf{578.316}$

3. Compare the following decimals :

(i) $50.85 < 83.98$

(ii) $81.983 > 8.999$

(iii) $302.98 < 509.80$

(iv) $6.009 < 8.9$

4. Arrange the following decimals in ascending order :

(i) 94.13, 94.06, 94.854, 94.5

Ascending order \rightarrow 94.06, 94.13, 94.5, 94.854

(ii) 39.21, 2.378, 4.05, 125.89

Ascending order \rightarrow 2.378, 4.05, 39.21, 125.89

5. Arrange the following decimals in descending order :

(i) 7.3, 8.73, 73.03, 7.33, 8.073

Descending order \rightarrow 73.03, 8.73, 8.073, 7.33, 7.3

(ii) 3.3, 3.03, 30.3, 30.03, 3.003

Descending order \rightarrow 30.3, 30.03, 3.3, 3.03, 3.003

EXERCISE- 6B

1. Convert each of the following decimals into a fraction in its simplest form :

(i) 0.04

$$\Rightarrow 0.04 = \frac{0.04 \times 100}{1 \times 100} = \frac{4}{100} = \frac{1}{25}$$

(ii) 0.25

$$\Rightarrow 0.25 = \frac{0.25 \times 100}{1 \times 100} = \frac{25}{100} = \frac{1}{4}$$

(iii) 0.125

$$\Rightarrow 0.125 = \frac{0.125 \times 1000}{1 \times 1000} = \frac{125}{1000} = \frac{1}{8}$$

(iv) 13.45

$$\Rightarrow 13.45 = \frac{13.45 \times 100}{1 \times 100} = \frac{1345}{100} = \frac{269}{20} = 13 \frac{9}{20}$$

2. Convert each of the following fractions into decimals :

(i) $\frac{25}{4}$

On dividing $\frac{25}{4}$, we get

$$\begin{array}{r} 4 \overline{) 25} \quad (6.25 \\ \underline{-24} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

$$\therefore \frac{25}{4} = 6.25$$

(ii) $12\frac{3}{8} = \frac{12 \times 8 + 3}{8} = \frac{99}{8}$

On dividing $\frac{99}{8}$, we get

$$\begin{array}{r} 8 \overline{) 99} \quad (12.375 \\ \underline{-8} \\ 19 \\ \underline{-16} \\ 30 \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

$$\therefore 12\frac{3}{8} = 12.375$$

$$(iii) \frac{385}{1000}$$

On dividing $\frac{385}{1000}$, we get

$$\begin{array}{r} 1000 \overline{)3850} \quad (0.385 \\ \underline{-3000} \\ 8500 \\ \underline{-8000} \\ 5000 \\ \underline{-5000} \\ 0 \end{array}$$

$$\therefore \frac{385}{1000} = 0.385$$

$$(iv) \frac{1713}{100}$$

On dividing $\frac{1713}{100}$, we get

$$\begin{array}{r} 100 \overline{)1713} \quad (17.13 \\ \underline{-100} \\ 713 \\ \underline{-700} \\ 130 \\ \underline{-100} \\ 300 \\ \underline{-300} \\ 0 \end{array}$$

$$\therefore \frac{1713}{100} = 17.13$$

3. Express in kg by using decimals :

$$(i) 5g = \frac{5}{1000} \text{ kg} = 0.005 \text{ kg} \quad (ii) 75g = \frac{75}{1000} \text{ kg} = 0.075 \text{ kg}$$

$$\begin{array}{ll} (iii) 8 \text{ kg } 47g = 8 \text{ kg} + \frac{47}{1000} \text{ kg} & (iv) 15 \text{ kg } 242g = 15 \text{ kg} + \frac{242}{1000} \text{ kg} \\ = 8 \text{ kg} + 0.047 \text{ kg} & = 15 \text{ kg} + 0.242 \text{ kg} \\ = 8.047 \text{ kg} & = 15.242 \text{ kg} \end{array}$$

4. Express in km by using decimals :

$$(i) 8 \text{ m} = \frac{8}{1000} \text{ km} = 0.008 \text{ km} \quad (ii) 48 \text{ m} = \frac{48}{1000} \text{ km} = 0.048 \text{ km}$$

$$\begin{array}{l} (iii) 150 \text{ km } 335 \text{ m} = 150 \text{ km} + \frac{335}{1000} \text{ km} \\ = 150 \text{ km} + 0.335 \text{ km} = 150.335 \text{ km} \end{array}$$

$$\begin{aligned}
 \text{(iv) } 8 \text{ km } 58 \text{ m} &= 8 \text{ km} + \frac{58}{1000} \text{ km} \\
 &= 8 \text{ km} + 0.058 \text{ km} = 8.058 \text{ km}
 \end{aligned}$$

5. Express in ₹ by using decimals :

$$\text{(i) } 5 \text{ paise} = ₹ \frac{5}{100} = ₹ 0.05 \quad \text{(ii) } 25 \text{ paise} = ₹ \frac{25}{100} = ₹ 0.25$$

$$\text{(iii) } ₹ 74 \text{ and } 15 \text{ paise} = ₹ 74 + ₹ \frac{15}{100} = ₹ 74 + ₹ 0.15 = ₹ 74.15$$

$$\text{(iv) } ₹ 150 \text{ and } 19 \text{ paise} = ₹ 150 + ₹ \frac{19}{100} = ₹ 150 + ₹ 0.19 = ₹ 150.19$$

EXERCISE- 6C

1. Add the following decimals :

(i) 27.08, 32.87, 27.88 and 29.9

$$\begin{array}{r}
 27.08 \\
 32.87 \\
 27.88 \\
 + 29.90 \\
 \hline
 117.73
 \end{array}$$

Hence, the sum of the given decimal is 117.73.

(ii) 121.21, 125.67, 136.09, 10.184, 15.607 and 123.897

$$\begin{array}{r}
 121.210 \\
 125.670 \\
 136.090 \\
 10.184 \\
 15.607 \\
 + 123.897 \\
 \hline
 532.658
 \end{array}$$

Hence, the sum of the given decimals is 532.658.

2. Cost of a book = ₹ 238.85

Cost of a pen = ₹ 52.00

Cost of a notebook = + ₹ 16.15

Total cost for these items = ₹ 307.00

Hence, total money pay to the shopkeeper for these items by Kirti is ₹ 307.00.

- | | Kg | g |
|---|------------|-----|
| 3. The state of Rajasthan produced of wheat = | 3757025 | 380 |
| The state of Haryana produced of wheat = | 40307926 | 430 |
| The state of U.P. produced of what = | + 28795874 | 850 |
| Total number of wheat produced by | 72860826 | 660 |

these three states

Hence, the total number of wheat produced by there three states
 $= 72860826 \text{ kg } 660 \text{ g}$

- | | kg | g |
|--|------|-----|
| 4. Weight of an empty gas cylinder = | 16 | 750 |
| Weight of gas = | + 14 | 350 |
| Total weight of the cylinder filled with gas = | 31 | 100 |

Hence, the total weight of the cylinder filled with gas is 31 kg 100 g.

- | | km | m |
|---|------|-----|
| 5. Distance cover during the first hour = | 85 | 435 |
| Distance cover during the second hour = | 76 | 045 |
| Distance cover during the third hour = | + 52 | 007 |
| Total distance cover in 3 hours = | 213 | 487 |

Hence, the length of his journey is 213 km 487 m.

EXERCISE- 6D

1. Subtract :

- (i) 37.82 from 68.24

$$\begin{array}{r} 68.24 \\ - 37.82 \\ \hline 30.42 \end{array}$$

Hence, $68.24 - 37.82 = 30.42$

- (iii) 93.91 from 97.6

$$\begin{array}{r} 97.60 \\ - 93.91 \\ \hline 03.69 \end{array}$$

Hence, $97.60 - 93.91 = 3.69$

- (ii) 78.92 from 105.84

$$\begin{array}{r} 105.84 \\ - 78.92 \\ \hline 26.92 \end{array}$$

Hence, $105.84 - 78.92 = 26.92$

- (iv) 154.8 from 308

$$\begin{array}{r} 308.00 \\ - 154.80 \\ \hline 153.20 \end{array}$$

Hence, $308.00 - 154.80 = 153.20$

2. Simplify :

- (i) $63.4 - 8.545 - 6.33$

Adding negative numbers separately, we get

$$\begin{array}{r}
 8.545 \\
 + 6.330 \\
 \hline
 14.875
 \end{array}$$

Now, subtracting the sum of negative numbers from the positive number, we get

$$\begin{array}{r}
 63.400 \\
 - 14.875 \\
 \hline
 48.525
 \end{array}$$

Hence, $63.4 - 8.545 - 6.33 = 48.525$

(ii) $1023.6 + 77.84 - 56.372 - 908$

Adding positive numbers and negative numbers separately, we get

$$\begin{array}{r}
 1023.60 \\
 + 77.84 \\
 \hline
 1101.44
 \end{array}
 \qquad
 \begin{array}{r}
 56.372 \\
 + 908.000 \\
 \hline
 964.372
 \end{array}$$

Now, subtracting the sum of negative numbers from the sum of positive numbers, we get

$$\begin{array}{r}
 1101.440 \\
 - 964.372 \\
 \hline
 137.068
 \end{array}$$

Hence, $1023.6 + 77.84 - 56.372 - 908 = 137.068$

3. Aditya had = ₹ 7.45

Aditya bought toffees = -₹ 5.30

The balance amount left with Aditya = ₹ 2.15

Hence, the balance amount left with Aditya = ₹ 2.15

4. Kirti's school distance from her house = $\begin{array}{cc} \text{km} & \text{m} \\ 5 & 350 \end{array}$

Kirti travels by foot = $\begin{array}{cc} -1 & 070 \end{array}$

Kirti travel by bus = $\begin{array}{cc} 4 & 280 \end{array}$

Hence, Kirti distance travel by bus = $\begin{array}{cc} 4 \text{ km} & 280 \text{ m} \end{array}$

5. Seeta bought a watermelon weight = $\begin{array}{cc} \text{kg} & \text{g} \\ 5 & 200 \end{array}$

Seeta gave to her neighbour = $\begin{array}{cc} -2 & 750 \end{array}$

The weight of the watermelon left with Seeta = $\begin{array}{cc} 2 & 450 \end{array}$

Hence, the weight of the watermelon left with Seeta = 2kg 450 g

MULTIPLE CHOICE QUESTIONS

1. $24.8 = 24\frac{4}{5}$

Hence, the correct option is (a).

2. $4\frac{7}{8} = 4.875$

Hence, the correct option is (c).

3. $\frac{6}{25} = 0.24$

Hence, the correct option is (b).

4. $\frac{134}{1000} = 0.134$

Hence, the correct option is (c).

5. The correct expanded form of 2.06 is $2 \times 1 + 6 \times \frac{1}{100}$.

Hence, the correct option is (c).

6. Among 2.6, 2.006, 2.66 and 2.08, the largest number is 2.66.

Hence, the correct option is (d).

7. Correct order : $2.002 < 2.02 < 2.2 < 2.222$

Hence, the correct option is (b).

8. Which is the larger : 2.1 or 2.055 ? 2.1 is the largest.

Hence, the correct option is (a).

9. 1 cm = 0.01 m

Hence, the correct option is (b).



Simplification



EXERCISE - 7

1. Simplify :

$$\begin{aligned} \text{(i) } 21 - 12 \div 3 \times 2 &= 21 - 4 \times 2 \\ &= 21 - 8 \\ &= 13 \end{aligned}$$

[removing '÷']

[removing '×']

[removing '-']

$$\begin{aligned} \text{(ii) } 13 - (12 - 6 \div 3) &= 13 - (12 - 2) \\ &= 13 - 10 \\ &= 3 \end{aligned}$$

[performing division]

[performing subtraction]

[performing subtraction]

$$\begin{aligned}
 \text{(iii)} \quad & 36 - [18 - \{14 - (15 - 4 \div 2 \times 2)\}] \\
 & = 36 - [18 - \{14 - (15 - 2 \times 2)\}] && \text{[removing '\div']} \\
 & = 36 - [18 - \{14 - (15 - 4)\}] && \text{[removing '\times']} \\
 & = 36 - [18 - \{14 - 11\}] && \text{[removing parentheses]} \\
 & = 36 - [18 - 3] && \text{[removing braces]} \\
 & = 36 - 15 && \text{[removing square brackets]} \\
 & = 21
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} \quad & 4\frac{4}{5} \div \frac{3}{5} + 5 + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5} \\
 & = \frac{24}{5} \div \frac{3}{5} + 5 + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5} \\
 & = \frac{24}{5} \div \frac{3}{5} + 5 + \frac{6}{25} - \frac{1}{5} && \text{[removing '\times']} \\
 & = 8 + 5 + \frac{6}{25} - \frac{1}{5} && \text{[removing '\div']} \\
 & = \frac{200 + 125 + 6 - 5}{25} = \frac{326}{25} \\
 & = 13\frac{1}{25} && \text{[performing addition and subtraction]}
 \end{aligned}$$

$$\begin{aligned}
 \text{(v)} \quad & 7\frac{1}{3} \div \frac{2}{3} \text{ of } 2\frac{1}{5} + 1\frac{3}{8} \div 2\frac{3}{4} - 1\frac{1}{2} \\
 & = \frac{22}{3} \div \left(\frac{2}{3} \times \frac{11}{5}\right) + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} && \text{[removing 'of']} \\
 & = \frac{22}{3} \div \frac{22}{15} + \frac{11}{8} \div \frac{11}{4} - \frac{3}{2} \\
 & = \frac{22}{3} \times \frac{15}{22} + \frac{11}{8} \times \frac{4}{11} - \frac{3}{2} && \text{[removing '\div']} \\
 & = 5 + \frac{1}{2} - \frac{3}{2} && \text{[removing '\times']} \\
 & = \frac{10 + 1 - 3}{2} = \frac{8}{2} && \text{[performing addition and subtraction]}
 \end{aligned}$$

$$\begin{aligned}
 \text{(vi)} \quad & 9\frac{3}{4} \div \left[2\frac{1}{6} + \left\{ 4\frac{1}{3} - \left(1\frac{1}{2} + 1\frac{3}{4} \right) \right\} \right] \\
 & = \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \left(\frac{3}{2} + \frac{7}{4} \right) \right\} \right] \\
 & = \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \frac{6+7}{4} \right\} \right] && \text{[removing parentheses]}
 \end{aligned}$$

$$= \frac{39}{4} \div \left[\frac{13}{6} + \left\{ \frac{13}{3} - \frac{13}{4} \right\} \right]$$

$$= \frac{39}{4} \div \left[\frac{13}{6} + \frac{52-39}{12} \right]$$

[removing braces]

$$= \frac{39}{4} \div \left[\frac{13}{6} + \frac{13}{12} \right]$$

$$= \frac{39}{4} \div \frac{26+13}{12}$$

[removing square brackets]

$$= \frac{39}{4} \div \frac{39}{12} = \frac{39}{4} \times \frac{12}{39}$$

[removing '÷']

$$= 3$$

[removing '×']

$$(vii) \quad 1\frac{5}{6} + \left[2\frac{2}{3} - \left\{ 3\frac{3}{4} \left(3\frac{4}{5} \div 9\frac{1}{2} \right) \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \left(\frac{19}{5} \div \frac{19}{2} \right) \right\} \right]$$

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \left(\frac{19}{5} \times \frac{2}{19} \right) \right\} \right]$$

[removing '÷']

$$= \frac{11}{6} + \left[\frac{8}{3} - \left\{ \frac{15}{4} \times \frac{2}{5} \right\} \right]$$

[removing parentheses]

$$= \frac{11}{6} + \left[\frac{8}{3} - \frac{3}{2} \right]$$

[removing braces]

$$= \frac{11}{6} + \frac{16-9}{6}$$

[removing square brackets]

$$= \frac{11}{6} + \frac{7}{6} = \frac{11+7}{6} = \frac{18}{6} = 3$$

[performing addition]

$$(viii) \quad 7\frac{1}{2} - \left[2\frac{1}{4} \div \left\{ 1\frac{1}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{1}{3} - \frac{1}{6} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{2-1}{6} \right) \right\} \right]$$

[removing bar]

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{3}{2} - \frac{1}{6} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left(\frac{9-1}{6} \right) \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \times \frac{8}{6} \right\} \right] \quad [\text{removing parentheses}]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{ \frac{5}{4} - \frac{8}{12} \right\} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \frac{15-8}{12} \right] \quad [\text{removing braces}]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \div \frac{7}{12} \right]$$

$$= \frac{15}{2} - \left[\frac{9}{4} \times \frac{12}{7} \right] \quad [\text{removing '}\div\text{'}]$$

$$= \frac{15}{2} - \frac{27}{7} \quad [\text{removing square brackets}]$$

$$= \frac{105-54}{14} = \frac{51}{14} \quad [\text{Performing subtraction}]$$

$$= \frac{51}{14} = 3\frac{9}{14}$$

2. Find the square root of the following :

$$(i) \sqrt{625} = \sqrt{5 \times 5 \times 5 \times 5} \quad (ii) \sqrt{298} = \sqrt{17 \times 17} = 17$$

$$= 5 \times 5 = 25$$

$$(iii) \sqrt{961} = \sqrt{31 \times 31} \quad (iv) \sqrt{1849} = \sqrt{43 \times 43}$$

$$= 31 \quad = 43$$

$$(v) \sqrt{2401} = \sqrt{7 \times 7 \times 7 \times 7} \quad (vi) \sqrt{169} = \sqrt{13 \times 13}$$

$$= 7 \times 7 = 49 \quad = 13$$

MULTIPLE CHOICE QUESTIONS

1. $8 - [28 \div \{34 - (36 - 18 \div 9 \times 8)\}] = 6$

Hence, the correct option is (a).

2. $32 - [48 \div \{36 - (27 - 16 - 9)\}] = 29$

Hence, the correct option is (a).

3. $100 \times 10 - 100 + 2000 \div 100 = 920$

Hence, the correct option is (b).

4. $3640 - 14 \div 7 \times 2 = ?$

Hence, the correct option is (a).

5. $133 + 28 \div 7 - 8 \times 2 = 121$

Hence, the correct option is (b).

6. $1001 \div 11$ of $13 = 7$

Hence, the correct option is (a).

7. $13 - (12 - 6 \div 3) = ?$

Hence, the correct option is (d).

8. $54 \div 3$ of $6 + 9 \Rightarrow 54 \div 3 = 18$ of $6 = 3 + 9 = 12$

Hence, the correct option is (b).

9. $8 + 4 \div 2 \times 5 = 18$

Hence, the correct option is (c).

10. $15 + 5 \div 5 \times 2 = 15 + 2 = 17$

Hence, the correct option is (c).



Ratio, Proportional and Unitary Method



EXERCISE- 8A

1. Write the following ratio in the simplest form :

(i) $15 : 25 = \frac{15}{25} = \frac{15 \div 5}{25 \div 5}$ (HCF of 15 and 25 is 5)
 $= \frac{3}{5}$

$\therefore 15 : 25 = 3 : 5$

(ii) $32 : 36 = \frac{32}{36} = \frac{32 \div 4}{36 \div 4}$ (HCF of 32 and 36 is 4)
 $= \frac{8}{9}$

$\therefore 32 : 36 = 8 : 9$

(iii) $480 : 560 = \frac{480}{560} = \frac{480 \div 80}{560 \div 80}$ (HCF of 480 and 560 is 80)
 $= \frac{6}{7}$

$\therefore 480 : 560 = 6 : 7$

(iv) $2500 : 1250 = \frac{2500}{1250} = \frac{2500 \div 1250}{1250 \div 1250}$ (HCF of 2500 and 1250 is 1250)
 $= \frac{2}{1}$

$\therefore 2500 : 1250 = 2 : 1$

2. Write the following ratio in the simplest form :

$$\begin{aligned} \text{(i) } 250 \text{ cm to } 5 \text{ m} &= 250 \text{ cm} : 5 \text{ m} \\ &= 250 \text{ cm} : 500 \text{ cm} & (\because 1 \text{ m} = 100 \text{ cm}) \\ &= \frac{250 \div 250}{500 \div 250} & (\text{HCF of } 250 \text{ and } 500 \text{ is } 250) \\ &= \frac{1}{2} \end{aligned}$$

$$\therefore 250 \text{ cm} : 5 \text{ cm} = 1 : 2$$

$$\begin{aligned} \text{(ii) } 6 \text{ hours to } 45 \text{ minutes} &= 6 \text{ hours} : 45 \text{ minutes} \\ &= 6 \times 60 \text{ minutes} : 45 \text{ minutes} & (\because 1 \text{ hour} = 60 \text{ minutes}) \\ &= 360 \text{ minutes} : 45 \text{ minutes} \\ &= \frac{360 \div 45}{45 \div 45} & (\text{HCF of } 360 \text{ and } 45 \text{ is } 45) \\ &= \frac{8}{1} \end{aligned}$$

$$\therefore 6 \text{ hours} : 45 \text{ minutes} = 8 : 1$$

$$\begin{aligned} \text{(iii) } 80 \text{ paise to } ₹ 4 &= 80 \text{ paise} : ₹ 4 \\ &= 80 \text{ paise} : 4 \times 100 \text{ paise} & (\because ₹ 1 = 100 \text{ paise}) \\ &= 80 \text{ paise} : 400 \text{ paise} \\ &= \frac{80 \div 80}{400 \div 80} & (\text{HCF of } 80 \text{ and } 400 \text{ is } 80) \\ &= \frac{1}{5} \end{aligned}$$

$$\therefore 80 \text{ paise} : ₹ 4 = 1 : 5$$

$$\begin{aligned} \text{(iv) } 5 \text{ kg to } 650 \text{ g} &= 5 \text{ kg} : 650 \text{ g} \\ &= 5 \times 1000 \text{ g} : 650 \text{ g} & (\because 1 \text{ kg} = 1000 \text{ g}) \\ &= 5000 \text{ g} : 650 \text{ g} \\ &= \frac{5000 \div 50}{650 \div 50} & (\text{HCF of } 5000 \text{ and } 650 \text{ is } 50) \\ &= \frac{100}{13} \end{aligned}$$

$$\therefore 5 \text{ kg} : 650 \text{ g} = 100 : 13$$

3. Which is greater in following ratios :

$$\text{(i) } 2 : 3 \text{ or } 5 : 8$$

$$\text{We have, } 2 : 3 = \frac{2}{3} \text{ and } 5 : 8 = \frac{5}{8}$$

Making the denominator of each of the fraction equal

$$\frac{2}{3} = \frac{2 \times 8}{3 \times 8} = \frac{16}{24} \quad \text{and} \quad \frac{5}{8} = \frac{5 \times 3}{8 \times 3} = \frac{15}{24}$$

$$16 > 15$$

$$\therefore \frac{16}{24} > \frac{15}{24}$$

Hence, $2 : 3 > 5 : 8$

(ii) $3 : 8$ or $5 : 12$

$$\text{We have, } 3 : 8 = \frac{3}{8} \quad \text{and} \quad 5 : 12 = \frac{5}{12}$$

Making the denominator of each of the fraction equal

$$\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24} \quad \text{and} \quad \frac{5}{12} = \frac{5 \times 2}{12 \times 2} = \frac{10}{24}$$

$$9 < 10$$

$$\therefore \frac{9}{24} < \frac{10}{24}$$

Hence, $3 : 8 < 5 : 12$

(iii) $2 : 7$ or $6 : 8$

$$\text{We have, } 2 : 7 = \frac{2}{7} \quad \text{and} \quad 6 : 8 = \frac{6}{8}$$

Making the denominator of each of the fraction equal

$$\frac{2}{7} = \frac{2 \times 8}{7 \times 8} = \frac{16}{56} \quad \text{and} \quad \frac{6}{8} = \frac{6 \times 7}{8 \times 7} = \frac{42}{56}$$

$$16 < 42$$

$$\therefore \frac{16}{56} < \frac{42}{56}$$

Hence, $2 : 7 < 6 : 8$

(iv) $3 : 4$ or $9 : 16$

$$\text{We have, } 3 : 4 = \frac{3}{4} \quad \text{and} \quad 9 : 16 = \frac{9}{16}$$

Making the denominator of each of the fraction equal

$$\frac{3}{4} = \frac{3 \times 4}{4 \times 4} = \frac{12}{16} \quad \text{and} \quad \frac{9}{16}$$

$$12 > 9$$

$$\therefore \frac{12}{16} > \frac{9}{16}$$

Hence, $3 : 4 > 9 : 16$

4. Fill in the blank boxes :

$$(i) \frac{12}{20} = \frac{\square}{5}$$

$$\text{Let, } \frac{12}{20} = \frac{x}{5}$$

$$\text{Then, } 20 \times x = 12 \times 5$$

$$x = \frac{12 \times 5}{20} = \frac{60}{20}$$

$$x = 3$$

$$(ii) \frac{25}{20} = \frac{5}{\square}$$

$$\text{Let, } \frac{25}{20} = \frac{5}{x}$$

$$\text{Then, } 25 \times x = 20 \times 5$$

$$x = \frac{20 \times 5}{25} = \frac{100}{25}$$

$$x = 4$$

$$(iii) \frac{\square}{50} = \frac{5}{10}$$

$$\text{Let, } \frac{x}{50} = \frac{5}{10}$$

$$\text{Then, } x \times 10 = 50 \times 5$$

$$\Rightarrow x = \frac{50 \times 5}{10} = \frac{250}{10}$$

$$\Rightarrow x = 25$$

$$(iv) \frac{72}{\square} = \frac{36}{47}$$

$$\text{Let, } \frac{72}{x} = \frac{36}{47}$$

$$\text{Then, } x \times 36 = 72 \times 47$$

$$\Rightarrow x = \frac{72 \times 47}{36} = \frac{3384}{36} \Rightarrow x = 94$$

5. Length of a rectangular park = 27 metre

Breadth of a rectangular park = 18 metre

Ratio of length and breadth of a rectangular park = 27 m : 18 m

$$\therefore 27 \text{ m} : 18 \text{ m} = \frac{27 \div 9}{18 \div 9} \text{ (HCF of 27 and 18 is 9)}$$

$$= \frac{3}{2}$$

$$\therefore 27 \text{ m} : 18 \text{ m} = 3 \text{ m} : 2 \text{ m}$$

6. The ratio of angle of a triangle = 2 : 3 : 4

Total angle of a triangle = 180°

Sum of the ratio terms = $2 + 3 + 4 = 9$

$$\text{First angle} = 180^\circ \times \frac{2}{9} = 40^\circ$$

$$\text{Second angle} = 180^\circ \times \frac{3}{9} = 60^\circ$$

$$\text{Third angle} = 180^\circ \times \frac{4}{9} = 80^\circ$$

7. Mr. Aditya earns per month = ₹ 5000

Mr. Aditya spends per month = ₹ 3000

∴ Mr. Aditya saving per month = ₹ 5000 – ₹ 3000 = ₹ 2000

(i) Ratio of his income and expenditure = ₹ 5000 : ₹ 3000

$$= \frac{5000}{3000} = \frac{5000 \div 1000}{3000 \div 1000}$$

(∵ HCF of 5000 and 3000 is 1000)

$$= \frac{5}{3}$$

Hence, the ratio of Mr. Aditya income and expenditure is 5 : 3.

(ii) Ratio of his expenditure and income = ₹ 3000 : ₹ 5000

$$= \frac{3000}{5000} = \frac{3000 \div 1000}{5000 \div 1000}$$

(∵ HCF of 3000 and 5000 is 1000)

$$= \frac{3}{5}$$

Hence, the ratio of Mr. Aditya expenditure and savings is 3 : 5.

EXERCISE- 8B

1. Which of the following are in proportion :

(i) 1, 2, 12, 24

Product of exteme terms = $1 \times 24 = 24$

and Product of middle terms = $2 \times 12 = 24$

We know, product of extreme terms = product of middle terms

So, $24 = 24$

Thus, 1, 2, 12, 24 are in proportion.

(ii) 50, 35, 35, 50

Product of exteme terms = $50 \times 50 = 2500$

and Product of middle terms = $35 \times 35 = 1225$

We know,

product of extreme terms = product of middle terms

But, $2500 \neq 1225$

Thus, 50, 35, 35, 50 are not in proportion.

(iii) 15, 18, 45, 54

Product of extreme terms $= 15 \times 54 = 810$

and Product of middle terms $= 18 \times 45 = 810$

We know,

product of extreme terms = product of middle terms

So, $810 = 810$

Thus, 15, 18, 45, 54 are in proportion.

2. Fill the number in blank by which, all the numbers become proportional:

(i) 7, 21, 5, \square

Let the fourth term be x , then

$$7 : 21 :: 5 : x$$

We know that,

Product of extreme terms = Product of middle terms

or $7 \times x = 21 \times 5$

or $x = \frac{21 \times 5}{7}$

or $x = 3 \times 5 = 15$

Hence, the fourth term of proportion is 15.

(ii) 12, 24, \square , 48

Let the third term be x , then

$$12 : 24 :: x : 48$$

We know that,

Product of extreme terms = Product of middle terms

or $12 \times 48 = 24 \times x$

or $x = \frac{12 \times 48}{24}$

or $x = 12 \times 2 = 24$

Hence, the third term of proportion is 24.

(iii) 30, \square , 45, 60

Let the second term be x , then

$$30 : x :: 45 : 60$$

We know that,

Product of extreme terms = Product of middle terms

or $30 \times 60 = x \times 45$

$$\text{or} \quad x = \frac{30 \times 60}{45}$$

$$\text{or} \quad x = \frac{1800}{45}$$

$$\text{or} \quad x = 40$$

Hence, the second term of proportion is 40.

(iv) Let the third term be x , then

$$15 : 45 :: x : 54$$

We know that,

Product of extreme terms = Product of middle terms

$$\text{or} \quad 15 \times 54 = 45 \times x$$

$$\text{or} \quad x = \frac{15 \times 54}{45}$$

$$\text{or} \quad x = \frac{810}{45}$$

$$\text{or} \quad x = 18$$

Hence, the third term of proportion is 18.

4. Let the fourth term be x , then

$$8 : 32 :: 25 : x$$

We know that,

Product of extreme terms = Product of middle terms

$$\text{or} \quad 8 \times x = 32 \times 25$$

$$\text{or} \quad x = \frac{32 \times 25}{8}$$

$$\text{or} \quad x = 4 \times 25$$

$$\text{or} \quad x = 100$$

Hence, the fourth term of proportion is 100.

5. $x, 7, 20, 28$

$$\therefore \quad x : 7 :: 20 : 28$$

We know that,

Product of extreme terms = Product of middle terms

$$\text{or} \quad x \times 28 = 7 \times 20$$

$$\text{or} \quad x = \frac{7 \times 20}{28}$$

$$\text{or} \quad x = \frac{140}{28} \quad \text{or} \quad x = 5$$

Hence, the value of x proportion is 5.

6. 6, 18, x , 15

$$\therefore 6 : 18 :: x : 15$$

We know that,

Product of extreme terms = Product of middle terms

$$\text{or } 6 \times 15 = 18 \times x$$

$$\text{or } x = \frac{6 \times 15}{18} \quad \text{or } x = \frac{90}{18}$$

$$\text{or } x = 5$$

Hence, the value of x proportion is 5.

7. Let x be the middle proportion of 16 and 4, then $16 : x :: x : 4$

$$\text{or } x \times x = 16 \times 4$$

$$\text{or } x^2 = 64 \quad \text{or } x = \sqrt{64}$$

$$\text{or } x = 8$$

Hence, the middle proportion between 16 and 4 is 8.

8. If 9, 15 and x are in continued proportion, then

$$9 : 15 :: 15 : x$$

$$\text{or } 9 \times x = 15 \times 15$$

$$\text{or } x = \frac{15 \times 15}{9}$$

$$\text{or } x = \frac{225}{9} = 25$$

$$\text{Hence, } x = 25$$

EXERCISE- 8C

1. Cost of 12 pens (1 dozen pens) = ₹ 192

$$\therefore \text{Cost of 1 pen} = ₹ \frac{192}{12} = ₹ 16$$

$$\therefore \text{Cost of 120 pens} = ₹ 16 \times 120 = ₹ 1920$$

Hence, the cost of 120 pens is ₹ 1920.

2. Cost of 3 television sets = ₹ 25350

$$\therefore \text{Cost of 1 television set} = \frac{₹ 25350}{3} = ₹ 8450$$

$$\therefore \text{Cost of 18 television sets} = ₹ 8450 \times 18 = ₹ 152100$$

Hence, the cost of 18 television sets is ₹ 1,52,100.

3. A scooter runs on 2 litres petrol = 80 km

$$\therefore \text{A scooter runs on 1 litres petrol} = \frac{80}{2} = 40 \text{ km}$$

$$\begin{aligned}\therefore \text{Petrol consume to run 200 km in a scooter} &= \frac{200 \text{ km}}{40 \text{ km}} \\ &= 5 \text{ litres petrol}\end{aligned}$$

Hence, 5 litres petrol will be consume to run 200 km.

4. Car covers a distance in 3 hours = 210 km

$$\therefore \text{Car travels a distance in 1 hour} = \frac{210}{3} \text{ km} = 70 \text{ km}$$

$$\therefore \text{Car travels a distance in 7 hours} = 70 \times 7 \text{ km} = 490 \text{ km}$$

Hence, the car covered a distance in 7 hours = 490 km

5. Weight of 54 books = 9 kg

$$\therefore \text{Weight of 1 book} = \frac{9}{54} \text{ kg} = \frac{1}{6} \text{ kg}$$

$$\therefore \text{Weight of 24 such books} = \left(\frac{1}{6} \times 24 \right) \text{ kg} = 4 \text{ kg}$$

Hence, the weight of 24 books is 4 kg.

6. Cost of 5 books = ₹ 22.50

$$\therefore \text{Cost of 1 book} = \frac{\text{₹ } 22.50}{5} = \text{₹ } 4.50$$

$$\therefore \text{Cost of 7 books} = \text{₹ } 4.50 \times 7 = \text{₹ } 31.50$$

Hence, the cost of 7 books is ₹ 31.50.

7. 160 scout guides have food = 5 days

$$\therefore 1 \text{ scout guide have food} = 160 \times 5 \text{ days}$$

$$\begin{aligned}\therefore 200 \text{ scout guide have food} &= \frac{160 \times 5}{200} \text{ days} \\ &= \frac{800}{200} \text{ days} = 4 \text{ days}\end{aligned}$$

8. Number of workers a road built in 70 days = 55

$$\text{Number of workers a road built in 1 day} = 55 \times 70$$

$$\therefore \text{Number of workers a road built in 35 days} = \frac{55 \times 70}{35} = 110$$

Hence, 110 workers would build the road in 35 days.

MULTIPLE CHOICE QUESTIONS

- If 126, 72, 21 and 12 are in proportion, then $126 \times 12 = 72 \times 21$
Hence, the correct option is (c).
- If $a : b :: c : d$, then a and d are called extreme terms.
Hence, the correct option is (c).

3. The ratio of 5 metres to 25 metres in the simplest form is 1 : 5.
Hence, the correct option is (b).
4. The cost of 12 pencils is ₹ 18, then the cost of 8 pencils is ₹ 12.
Hence, the correct option is (b).
5. The cost of 10 bananas is ₹ 20, then the cost of 6 bananas is ₹ 12.
Hence, the correct option is (c).
6. The ratio of 312 : 644 in the simplest form is 78 : 161.
Hence, the correct option is (b).
7. The ratio 168 : 70 in the simplest form is 12 : 5.
Hence, the correct option is (c).
8. The ratio of 35 seconds to 28 seconds in the simplest form is 5 : 4.
Hence, the correct option is (c).



Algebraic Expressions



EXERCISE- 9A

1. Write the following by using number, literal and signs :
 - (i) 5 more than $x = x + 5$
 - (ii) 13 less than $y = y - 13$
 - (iii) 18 more than $\frac{x}{2} = \frac{x}{2} + 18$
 - (iv) 11 less than the quotient of x and $y = \frac{x}{y} - 11$
 - (v) Subtract x from $3y = 3y - x$
 - (vi) 42 more than the double of $x = 2x + 42$
2. Runs scored by Rohit Sharma = x
and runs scored by Virat Kohali
= 5 less than double of the Rohit Sharma runs
 \therefore Runs scored by Virat Kohali = $2x - 5$
3. Number of rows of mango trees in a garden = $2x$
Number of trees in each row = x^2
Total number of trees in the garden = $2x \times x^2 = 2x^3$ trees
4. Write the following in exponential form :
 - (i) $a \times a \times a \times a \times \dots$ 12 times = a^{12}
 - (ii) $14 \times x \times x \times x \times x \times x \times y \times y \times y \times y \times y = 14x^4y^5$

5. Write the following in product form :

(i) $x^2 y^3 = x \times x \times y \times y \times y$

(ii) $5a^5 = 5 \times a \times a \times a \times a \times a$

(iii) $17a^3 b^3 = 17 \times a \times a \times a \times b \times b \times b$

(iv) $10x^2 y^2 z = 10 \times x \times x \times y \times y \times z$

EXERCISE- 9B

1. Which of the following are monomial, binomial, trinomial and polynomial expressions :

(i) $3x^2$ is a **monomial**, because it has one term.

(ii) $2x^2 + 5y^2$ is a **binomial**, because it has two terms.

(iii) 7 is a **monomial**, because it has one term.

(iv) $5x - 3y + z$ is a **trinomial**, because it has three terms.

(v) $5x$ is a **monomial**, because it has one term.

(vi) $xy - 3$ is a **binomial**, because it has two terms.

(vii) $xy + yz + zx$ is a **trinomial**, because it has three terms.

(viii) $x^2 + 2xy + 3x^2 y + 7$ is a **polynomial**, because it has four terms.

2. Write the coefficient of x in the following expressions :

(i) $3yzx$

$$3yzx = (3yz)x$$

Hence, in $3yzx$, coefficient of x is $3yz$.

(ii) $-2yx + 7$

In $-2yx + 7$, the term of x is $-2yx$.

Hence, in $-2yx$, the coefficient of x is $-2y$.

(iii) $xy^2 z^3$

$$xy^2 z^3 = (y^2 z^3)x$$

Hence, in $xy^2 z^3$, coefficient of x is $y^2 z^3$.

(iv) $-\frac{2}{5}x + 18$

In $-\frac{2}{5}x + 18$, the term of x is $-\frac{2}{5}x$.

Hence, in $-\frac{2}{5}x$, the coefficient of x is $-\frac{2}{5}$.

3. Write the coefficient of y in the following expressions :

(i) $-5y$

Hence, in $-5y$, coefficient of y is -5 .

(ii) $7xy$

$$7xy = (7x)y$$

Hence, in $7xy$, the coefficient of y is $7x$.

(iii) $2x + 3y$

In $2x + 3y$, the term of y is $3y$.

Hence, in $3y$, the coefficient of y is 3 .

(iv) $-9yzx + 11$

In $-9yzx + 11$, the term of y is $-9yzx$.

Hence, in $-9yzx$, the coefficient of y is $-9zx$.

4. Write down the pairs of like terms in the following expressions:

(i) $3x^2y^2, -2y^2x^2$

In $3x^2y^2$ and $-2y^2x^2$, x^2y^2 and y^2x^2 are literal coefficients which are same.

Hence, these are like terms.

(ii) $4x^2y, 12xy^2$

In $4x^2y$ and $12xy^2$, x^2y and xy^2 are literal coefficients which are not same.

Hence, these are unlike terms.

(iii) $18ab^2, 20ab^2$

In $18ab^2$ and $20ab^2$, ab^2 and ab^2 are literal coefficients which are same.

Hence, these are like terms.

(iv) $15a^2bc, 7abc$

In $15a^2bc$ and $7abc$, a^2bc and abc are literal coefficients which are not same.

Hence, these are unlike terms.

EXERCISE- 9C

1. Find the sum of the following :

(i) $3x, 5x, 8x$

$$\Rightarrow 3x + 5x + 8x = (3 + 5 + 8)x = 16x$$

(ii) $4xy, 2xy, 7xy$

$$\Rightarrow 4xy + 2xy + 7xy = (4 + 2 + 7)xy = 13xy$$

(iii) $-12a^2bc, 17a^2bc, 5a^2bc$

$$\Rightarrow -12a^2bc + 17a^2bc + 5a^2bc = (-12 + 17 + 5)a^2bc = 10a^2bc$$

2. Subtract the following :

(i) $16x^2$ from $10x^2$

$$\Rightarrow 10x^2 - 16x^2 = (10 - 16)x^2 = -6x^2$$

(ii) $48x^2y$ from $52x^2y$

$$\Rightarrow 52x^2y - 48x^2y = (52 - 48)x^2y = 4x^2y$$

(iii) $-5pqr$ from $-10pqr$

$$\Rightarrow -10pqr - (-5pqr) = (-10 + 5)pqr = -5pqr$$

3. Simplify the following expression by collecting and combining like terms :

(i) $4a^2 + 5b - 6c + 6a^2 + 7b + 9c + 2a^2 - 5b + 4c$

$$= 4a^2 + 6a^2 + 2a^2 + 5b + 7b - 5b - 6c + 9c + 4c$$

$$= (4 + 6 + 2)a^2 + (5 + 7 - 5)b + (-6 + 9 + 4)c$$

$$= 12a^2 + 7b + 7c$$

(ii) $3x^2 - x + 7 - 8 + 5x - 2x^2 + 5x^2 - 4x + 2$

$$= 3x^2 - 2x^2 + 5x^2 - x + 5x - 4x + 7 - 8 + 2$$

$$= (3 - 2 + 5)x^2 + (-1 + 5 - 4)x + (7 - 8 + 2)$$

$$= 6x^2 + 0 \cdot x + 1 = 6x^2 + 1$$

(iii) $xy - yz + yz - zx + zx - xy$

$$= xy - xy - yz + yz - zx + zx$$

$$= (1 - 1)xy + (-1 + 1)yz + (-1 + 1)zx$$

$$= 0 \times xy + 0 \times yz + 0 \times zx = 0$$

4. Find the sum of the following :

(i) $2x - 3y + 4z$, $5x + 2y - 5z$

$$= 2x - 3y + 4z + 5x + 2y - 5z$$

$$= 2x + 5x - 3y + 2y + 4z - 5z \quad (\text{By grouping the like terms})$$

$$= (2 + 5)x + (-3 + 2)y + (4 - 5)z$$

$$= 7x - y - z$$

(ii) $4a - 5b + 9c$, $-a + b - 7c$, $2a - 3b + c$

$$= 4a - 5b + 9c + (-a) + b - 7c + 2a - 3b + c$$

$$= 4a - a + 2a - 5b + b - 3b + 9c - 7c + c$$

(By grouping the like terms)

$$= (4 - 1 + 2)a + (-5 + 1 - 3)b + (9 - 7 + 1)c$$

$$= 5a - 7b + 3c$$

(iii) $6x^3 - 5x^2y + 6xy^2 - 2y^3$, $x^3 - 2xy^2 - 3x^2y$, $y^3 - 3x^3 + xy^2$

$$= 6x^3 - 5x^2y + 6xy^2 - 2y^3 + x^3 - 2xy^2 - 3x^2y + y^3 - 3x^3 + xy^2$$

$$\begin{aligned}
 &= 6x^3 + x^3 - 3x^3 - 5x^2y - 3x^2y + 6xy^2 - 2xy^2 + xy^2 - 2y^3 + y^3 \\
 &\quad \text{(By grouping the like terms)} \\
 &= (6+1-3)x^3 + (-5-3)x^2y + (6-2+1)xy^2 + (-2+1)y^3 \\
 &= 4x^3 - 8x^2y + 5xy^2 - y^3
 \end{aligned}$$

5. Because the sum is $x^2 + 4xy - 2y^2$.

Hence, subtract $3x^2 - 7xy + 5y^2$ from the given sum.

$$\begin{array}{r}
 x^2 + 4xy - 2y^2 \\
 3x^2 - 7xy + 5y^2 \\
 - \quad + \quad - \\
 \hline
 -2x^2 + 11xy - 7y^2
 \end{array}$$

6. We find the subtract of both the given expressions

$$\begin{array}{r}
 3x^2 - 2xy + 6y^2 \\
 -4x^2 - 2xy - y^2 \\
 + \quad + \quad + \\
 \hline
 7x^2 + 0 + 7y^2
 \end{array}$$

$$\therefore 7x^2 + 7y^2 = 7(x^2 + y^2)$$

7. $A = 2x^2 - 3x + 1$, $B = 4x^2 + 2x - 7$ and $C = 3x^2 - 6x + 2$
 $A + B - C = ?$

Firstly, we find the sum of A and B

$$\begin{aligned}
 A + B &= 2x^2 - 3x + 1 + 4x^2 + 2x - 7 \\
 &= 2x^2 + 4x^2 - 3x + 2x + 1 - 7 \\
 &= (2+4)x^2 + (-3+2)x + (1-7) \\
 &= 6x^2 - x - 6
 \end{aligned}$$

Now, we subtract C from the sum $A + B$,

$$\begin{aligned}
 A + B - C &= (6x^2 - x - 6) - (3x^2 - 6x + 2) \\
 &= 6x^2 - x - 6 - 3x^2 + 6x - 2 \\
 &= 6x^2 - 3x^2 - x + 6x - 6 - 2 \\
 &= (6-3)x^2 + (-1+6)x + (-6-2) \\
 &= 3x^2 + 5x - 8
 \end{aligned}$$

8. If $x=2$, $y=3$ and $z=-4$, then find the value of the following expressions:

(i) $4xy^2 - 15x^2y + zx$

In expression $4xy^2 - 15x^2y + zx$, on substituting the value of x , y and z .

$$\begin{aligned}4xy^2 - 15x^2y + zx &= 4 \times 2 \times (3)^2 - 15 \times (2)^2 \times 3 + (-4) \times 2 \\&= 72 - 180 - 8 \\&= 72 - 188 \\&= -116\end{aligned}$$

(ii) $x^3 + y^3 + z^3 + 3xyz$

In expression $x^3 + y^3 + z^3 + 3xyz$, on substituting the value of x , y and z .

$$\begin{aligned}x^3 + y^3 + z^3 + 3xyz &= (2)^3 + (3)^3 + (-4)^3 + 3 \times 2 \times 3 \times (-4) \\&= 8 + 27 - 64 - 72 \\&= 35 - 136 \\&= -101\end{aligned}$$

9. If $a = 3$, $b = 2$ and $c = 5$, then find the value of the following expressions.

(i) $a^2 - 3b^2 + ac$

In expression $a^2 - 3b^2 + ac$, on substituting the value of a , b and c .

$$\begin{aligned}a^2 - 3b^2 + ac &= (3)^2 - 3 \times (2)^2 + 3 \times 5 \\&= 9 - 12 + 15 \\&= 24 - 12 \\&= 12\end{aligned}$$

(ii) $4a^3 + 2b^3 - 3c^3$

In expression $4a^3 + 2b^3 - 3c^3$, on substituting the value of a , b and c .

$$\begin{aligned}4a^3 + 2b^3 - 3c^3 &= 4 \times (3)^3 + 2 \times (2)^3 - 3 \times (5)^3 \\&= 4 \times 27 + 2 \times 8 - 3 \times 125 \\&= 108 + 16 - 375 \\&= 124 - 375 = -251\end{aligned}$$

10. If $x = 1$, $y = -2$ and $z = 3$, then find the value of the following expressions:

(i) $x^3 + y^3 + z^3 - 3xyz$

In expression $x^3 + y^3 + z^3 - 3xyz$, on substituting the value of x , y and z expressions:

$$\begin{aligned}x^3 + y^3 + z^3 - 3xyz &= (1)^3 + (-2)^3 + (3)^3 - 3 \times 1 \times (-2) \times 3 \\&= 1 - 8 + 27 + 18 \\&= 46 - 8 = 38\end{aligned}$$

(ii) $2xy^4 - 14x^2y + 4z$ on substituting the value of a , b and c .

In expression $2xy^4 - 14x^2y + 4z$, on substituting the value of x , y and z .

$$\begin{aligned}
 2xy^4 - 14x^2y + 4z &= 2 \times 1 \times (-2)^4 - 14 \times (1)^2 \times (-2) + 4 \times 3 \\
 &= 2 \times 16 + 28 + 12 \\
 &= 32 + 28 + 12 = 72
 \end{aligned}$$

MULTIPLE CHOICE QUESTIONS

1. The side of a square is 5 cm. Its perimeter is 20 cm.
Hence, the correct option is (b).
2. If 9 is added to x , then the expression is $9 + x$.
Hence, the correct option is (a).
3. If y is divided by 9, then the expression is $y/9$.
Hence, the correct option is (d).
4. If $2t = 10$, then t is 5.
Hence, the correct option is (a).
5. If t is subtracted from 5, then the expression is $5 - t$.
Hence, the correct option is (c).



Basic Geometrical Concepts

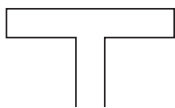


EXERCISE- 10A

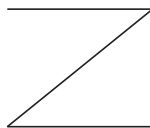
1. Do yourself.
2. (i) **Open Curves** : Curves that do not start and end at the same point are known as open curves.



(ii)

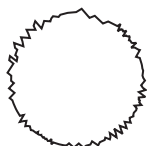


(iv)



(vi)

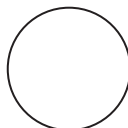
- (ii) **Closed Curves** : Curves that start and end at the same point are known as closed curves.



(i)

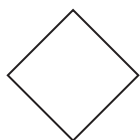


(iii)

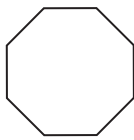


(v)

3. Polygon : A simple closed figure formed of three or more line segments is called a polygon.



(i)



(iii)



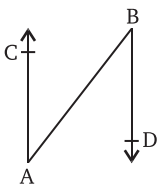
(iv)

EXERCISE- 10B

1. Identify and name the line segments and rays in each of the following figures.

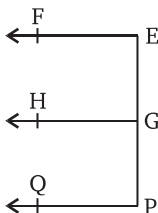
(i) Line segments = \overline{AB}

Rays = \overrightarrow{AC} , \overrightarrow{BD}



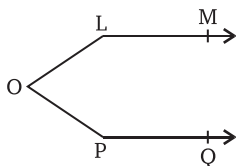
(ii) Line segments = \overline{GE} , \overline{GP} , \overline{EP}

Rays = \overrightarrow{EF} , \overrightarrow{GH} , \overrightarrow{PQ}

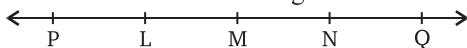


(iii) Line segments = \overline{OL} , \overline{OP}

Rays = \overrightarrow{LM} , \overrightarrow{PQ}



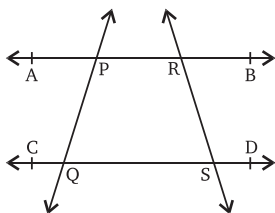
2. Consider the line \overleftrightarrow{PQ} given below and find whether the given statements are true or false:



- (i) M is a point on ray \overrightarrow{NQ} . (**False**)
 (ii) L is a point on ray \overrightarrow{MP} . (**True**)
 (iii) Ray \overrightarrow{MQ} is different from ray \overrightarrow{NQ} . (**True**)
 (iv) L, M, N are points on line segment \overline{LN} . (**True**)
 (v) Ray \overrightarrow{LP} is different from ray \overrightarrow{LQ} . (**True**)

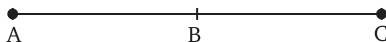
3. In the adjoining figure, name:

- (i) four line segments = $\overline{PR}, \overline{PQ}, \overline{RS}, \overline{QS}$
 (ii) four rays = $\overrightarrow{PA}, \overrightarrow{QC}, \overrightarrow{RB}, \overrightarrow{SD}$
 (iii) two non-intersecting line segments = \overline{PR} and \overline{QS}

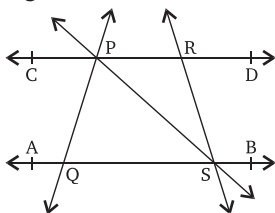


4. What do you mean by collinear points?

- (i) How many lines can you draw passing through three collinear points? = **One only**
 (ii) Given three collinear points A, B, C . How many line segments do they determine? Name them = **Three, $\overline{AB}, \overline{BC}, \overline{AC}$**



5. In the adjoining figure, name :



- (i) Four pairs of intersecting lines
 $\Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow$
 $\Rightarrow (\overline{AB}, \overline{PS}), (\overline{AB}, \overline{RS}), (\overline{CD}, \overline{PS}), (\overline{CD}, \overline{RS})$
 (ii) Four collinear points $\Rightarrow A, Q, S, B$
 (iii) Three non-collinear points $\Rightarrow A, C, B$
 $\Leftrightarrow \Leftrightarrow \Leftrightarrow$
 (iv) Three concurrent lines $\Rightarrow \overline{AB}, \overline{PS}, \overline{RS}$
 (v) Three lines whose point of intersection is $P \Rightarrow \overline{CD}, \overline{PQ}, \overline{PS}$

6. Fill in the blanks:

- (i) A line segment has **definite** length.
- (ii) A ray has **one** end point.
- (iii) A line has **no** end point.
- (iv) A ray has no **fixed** length.

7. Write 'T' for true and 'F' for false in case of each of the following statements:

- (i) Every point has a size. **(F)**
- (ii) A line segment has no length. **(F)**
- (iii) Every ray has a finite length. **(F)**
- (iv) One and only one ray can be drawn with a given end point. **(F)**

MULTIPLE CHOICE QUESTIONS

1. Unlimited number of rays can be drawn with a given point as the initial point.

Hence, the correct option is (c).

2. The maximum number of points of intersection of three lines in a plane is 3.

Hence, the correct option is (d).

3. Infinite lines can be drawn passing through a given point.

Hence, the correct option is (d).

4. A line segment can be drawn on a piece of paper.

Hence, the correct option is (b).

5. A ray has one end points.

Hence, the correct option is (b).

6. The face of full moon is circle.

Hence, the correct option is (c).

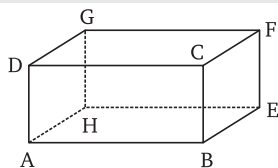


11 Parallel Lines



EXERCISE- 11A

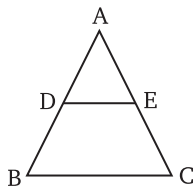
1. Name the groups of all possible parallel edges of the box whose figure is shown.



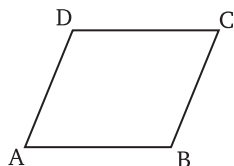
$[AB \parallel HE \parallel DC \parallel GF], [DA \parallel GH \parallel CB \parallel FE], [DG \parallel CF \parallel AH \parallel BE]$

2. Identify parallel line segments in each of the figures given below :

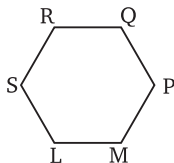
(i) $[DE \parallel BC]$



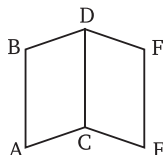
(ii) $[AB \parallel DC], [DA \parallel CB]$



(iii) $[LM \parallel RQ], [SL \parallel QP], [RS \parallel PM]$



(iv) $[BA \parallel DC \parallel FE], [AC \parallel BD]$ and $[CE \parallel DF]$



3. Do yourself.

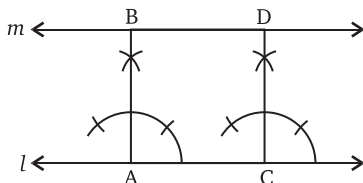
4. In fig. $l \parallel m$ and $AB \perp l$ and $CD \perp l$

$\therefore l \parallel m$, so perpendicular distances between them should be same everywhere.

$$\therefore AB = CD$$

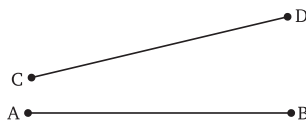
$$\therefore AB = 2.3 \text{ cm}$$

$$\therefore CD = 2.3 \text{ cm}$$



5. No, the segments AB and CD do not intersect.

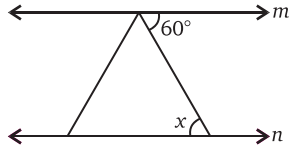
And AB and CD are not parallel because corresponding lines will intersect when produced in one direction.



EXERCISE- 11B

1. $x = 60^\circ$ (Alternate angles)

Because pairs of alternate interiors angles are equal.



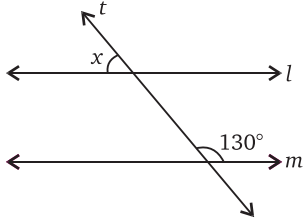
2. Look at the given figure, l and m are two parallel lines. When these lines in the same plane, t is the transversal of these lines which forms the corresponding angle .

We see that a pair of corresponding angle is equal to 180° .

$$\therefore x + 130^\circ = 180^\circ$$

$$x = 180^\circ - 130^\circ = 50^\circ$$

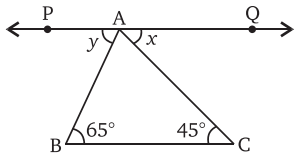
Thus, both the lines l and m are parallel.



3. $x = 45^\circ$ (Alternate angles)

$$y = 65^\circ \text{ (Alternate angles)}$$

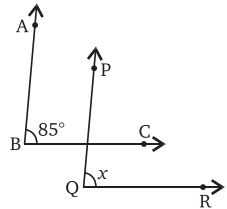
Because pairs of alternate interiors angles are equal.



4. $x = 85^\circ$ (Alternate angles)

\therefore The arms of two angles are parallel.

Because pairs of alternate interiors angles are equal.



5. Look at the given figure, l and m are two parallel lines. When these lines in the same plane, t is the transversal of these lines which forms the corresponding angle :

$$(3x - 2)^\circ = (x + 20)^\circ$$

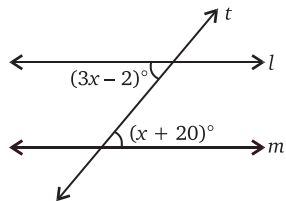
(Alternate angles)

$$3x - 2 = x + 20$$

$$3x - x = 20 + 2$$

$$2x = 22$$

$$x = 11$$



MULTIPLE CHOICE QUESTIONS

- Two straight lines in same plane which never meet are called parallel lines.
Hence, the correct option is (d).
- A line that intersects two lines in different points is known as transversal lines.
Hence, the correct option is (b).
- In the figure, $\angle a = 150^\circ$. The other angle in the figure, which is also 150° is $\angle d$.
Hence, the correct option is (c).
- If a transversal intersects two parallel lines, then each pair of corresponding angles is equal.
Hence, the correct option is (c).



12 Angles and Triangles

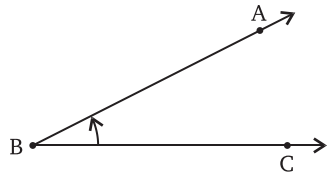
EXERCISE 12 A

- Name three examples of angles from your daily life.

- A pair of compass
- Scissors
- Hands of clock

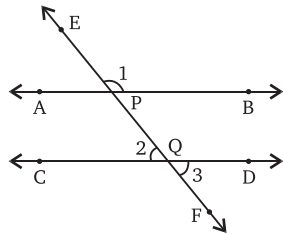
- Vertex = B

Arms = \overrightarrow{BA} and \overrightarrow{BC}



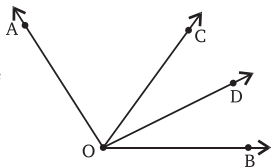
- In the adjoining figure, write another name for:

- $\angle 1 = \angle EPB$
- $\angle 2 = \angle PQC$
- $\angle 3 = \angle FQD$

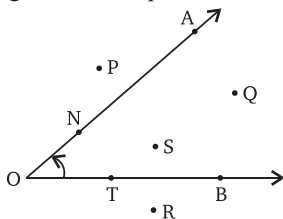


- Look at the adjacent figure and state which of the following statements are true and which are false:

- Point C is in the interior of $\angle AOB$. **False**
- Point C is in the interior of $\angle AOD$. **True**
- Point D is in the interior of $\angle AOC$. **False**
- Point B is in the exterior of $\angle AOD$. **True**
- Point C lies on $\angle AOB$. **False**



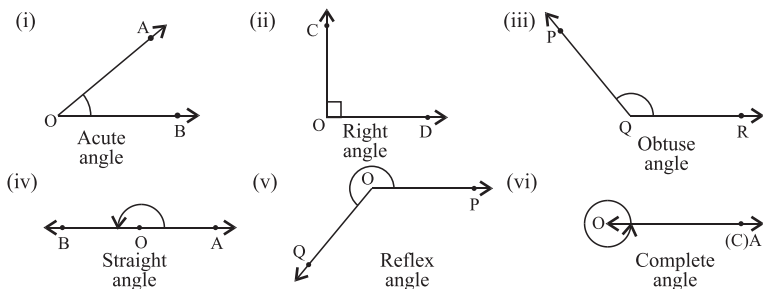
5. In the given figure, list the points which:



- (i) are in the interior of $\angle AOB = Q, S$
- (ii) are in the exterior of $\angle AOB = P, R$
- (iii) lie on $\angle AOB = A, O, B, T, N$

EXERCISE 12 B

1. An angle is formed by two adjacent fingers. What kind of angle will it appear? = Acute angle
2. State the type of each of the following angles:



3. Classify the following angles whose magnitudes are given below :

- (i) $40^\circ = \text{Acute angle}$
- (ii) $139^\circ = \text{Obtuse angle}$
- (iii) $90^\circ = \text{Right angle}$
- (iv) $0^\circ = \text{Zero angle}$
- (v) $180^\circ = \text{Straight angle}$
- (vi) $30^\circ = \text{Acute angle}$
- (vii) $270^\circ = \text{Reflex angle}$
- (viii) $360^\circ = \text{Complete angle}$

4. How many degrees are there in :

- (i) One right angle $= 1 \times 90^\circ = 90^\circ$
- (ii) Three right angles $= 3 \times 90^\circ = 270^\circ$
- (iii) $1\frac{1}{2}$ right angles $= \frac{3}{2}$ right angles $= \frac{3}{2} \times 90^\circ = 135^\circ$
- (iv) $\frac{2}{3}$ right angles $= \frac{2}{3} \times 90^\circ = 60^\circ$

5. A bicycle wheel has spokes = 48

A bicycle wheel is a complete angle.

\therefore An angle whose degree measure is 360° is called a complete angle.

\therefore Angle = 360°

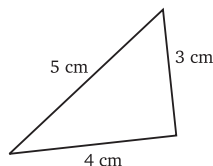
\therefore The angle between a pair of adjacent spokes = $\frac{360^\circ}{48} = 7.5^\circ$

EXERCISE- 12C

1. Look at the figures given below. The length of each side has been indicated along the side. State for each triangle whether it is scalene, isosceles or equilateral.

- (i) A triangle having all sides of different lengths is called a scalene triangle.

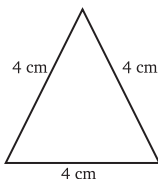
In given figure, $5\text{ cm} \neq 4\text{ cm} \neq 3\text{ cm}$



- (ii) A triangle having all sides equal is called an equilateral triangle.

In given figure,

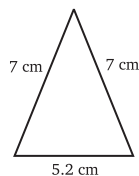
$$4\text{ cm} = 4\text{ cm} = 4\text{ cm}$$



- (iii) A triangle having two sides equal is called an isosceles triangle.

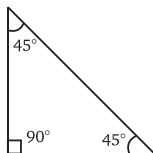
In given figure,

$$7\text{ cm} = 7\text{ cm} = 5.2\text{ cm}$$

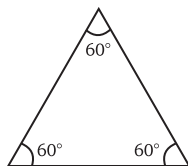


2. Classify the following triangles according to their angles:

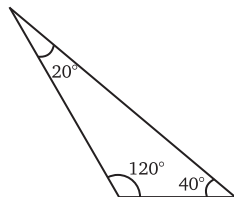
- (i) **Right Triangle** : A triangle whose one angle measures 90° , is called a right-angled triangle or simply a right triangle.



- (ii) **Acute Triangle** : A triangle whose all the three angles are acute (*i.e.*, less than 90°) is called an acute-angled triangle or an acute triangle.



(iii) Obtuse Triangle : A triangle one of whose angle measures more than 90° , is called an obtuse-angled triangle or simply an obtuse triangle.



3. Let third angle be x° .

According to angle sum property,

$$x^\circ + 72^\circ + 58^\circ = 180^\circ$$

$$x^\circ + 130^\circ = 180^\circ$$

$$x = 180^\circ - 130^\circ$$

$$x = 50^\circ$$

Hence, third angle is 50° .

4. Let the 1st angle A be $2x$.

$$\therefore \angle B = 3x \text{ and } \angle C = 4x$$

Sum of angles of a triangle = 180°

$$\Rightarrow 2x + 3x + 4x = 180^\circ$$

$$\Rightarrow 9x = 180^\circ$$

$$\Rightarrow x = \frac{180^\circ}{9}$$

$$\Rightarrow x = 20^\circ$$

$$\text{So, } \angle A = 2x = 2 \times 20^\circ = 40^\circ$$

$$\angle B = 3x = 3 \times 20^\circ = 60^\circ$$

$$\text{and } \angle C = 4x = 4 \times 20^\circ = 80^\circ$$

5. In a right triangle, one of the angles measures 90° .

Also, it is given that one of the acute angles measures 45° .

We know that according to the angle sum property, the sum of the angles of a triangle is 180° .

Therefore,

$$\text{Other acute angle} = 180^\circ - (90^\circ + 45^\circ)$$

$$= 180^\circ - 135^\circ$$

$$= 45^\circ$$

6. Let $3\angle A = 4\angle B = 6\angle C = x^\circ$

$$\text{Then, } \angle A = \left(\frac{x}{3}\right)^\circ; \angle B = \left(\frac{x}{4}\right)^\circ \text{ and } \angle C = \left(\frac{x}{6}\right)^\circ$$

$$\text{But } \angle A + \angle B + \angle C = 180^\circ$$

$$\begin{aligned}\therefore \quad \frac{x}{3} + \frac{x}{4} + \frac{x}{6} &= 180^\circ \\ 4x + 3x + 2x &= 180^\circ \times 12 \\ 9x &= 180^\circ \times 12 \\ x &= \frac{180^\circ \times 12}{9} \\ x &= 20 \times 12 = 240^\circ \\ \therefore \quad \angle A &= \left(\frac{240}{3} \right)^\circ = 80^\circ \\ \angle B &= \left(\frac{240}{4} \right)^\circ = 60^\circ \\ \text{and} \quad \angle C &= \left(\frac{240}{6} \right)^\circ = 40^\circ\end{aligned}$$

Hence, $\angle A = 80^\circ$, $\angle B = 60^\circ$ and $\angle C = 40^\circ$.

MULTIPLE CHOICE QUESTIONS

1. A triangle have 6 parts.
Hence, the correct option is (c).
2. Construction of triangle is possible if 50° , 70° , 60° .
Hence, the correct option is (b).
3. The angles of a triangle are in the ratio 2 : 3 : 4. The largest angle is 80.
Hence, the correct option is (b).
4. Each angle of an equilateral triangle measures is 60° .
Hence, the correct option is (c).
5. Two angles of a triangle measure 30° and 25° respectively. The measure of the 3rd angle is 125° .
Hence, the correct option is (d).
6. In an isosceles $\triangle ABC$, the bisectors of $\angle B$ and $\angle C$ meet at a point O . If $\angle A = 40^\circ$, then $\angle BOC = 110^\circ$
Hence, the correct option is (a).
7. One of the base angles of an isosceles triangle is 70° . The vertical angle is 40° .
Hence, the correct option is (c).

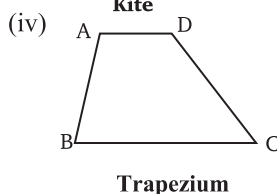
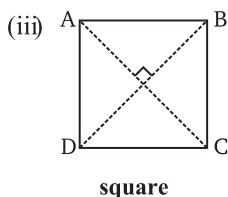
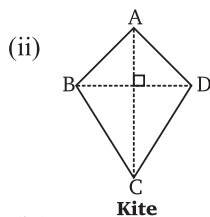
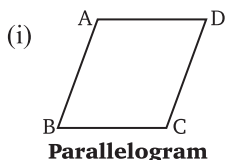


Types of Quadrilaterals



EXERCISE- 13A

1. Identify the following geometrical figures:



2. Let the sides of the parallelogram be $4x$ and $3x$.

$$\text{Perimeter of parallelogram} = 2(l + b)$$

$$\therefore 2(l + b) = 56 \text{ cm}$$

$$2(4x + 3x) = 56 \text{ cm}$$

$$2 \times 7x = 56 \text{ cm}$$

$$14x = 56 \text{ cm}$$

$$x = \frac{56}{14} \text{ cm}$$

$$x = 4 \text{ cm}$$

$$\text{Hence, length of parallelogram} = 4 \times 4 \text{ cm} = 16 \text{ cm}$$

$$\text{Breadth of parallelogram} = 3 \times 4 \text{ cm} = 12 \text{ cm}$$

3. Which quadrilateral has only one pair of parallel sides?

Ans. A quadrilateral having exactly one pair of parallel sides, is called a trapezium.

4. Which quadrilateral has both pairs of opposite sides parallel ?

Ans. A quadrilateral is said to be a parallelogram when its both pairs of opposite sides are parallel.

5. What can you say about the diagonals of a rectangle?

Ans. The diagonals of a rectangle are equal.

6. Name each of the following parallelograms :

(i) The diagonals are equal and the adjacent sides are unequal

= **Rectangle**

(ii) The diagonals as well as the adjacent sides are equal = **square**

(iii) The adjacent sides are equal but the diagonals are unequal

= **Rhombus**

7. \therefore The opposite angles are equal.

Let the measure of the angles of the given quadrilateral be

x° , $(5x)^\circ$, x° and $(5x)^\circ$.

Then, according to the angle sum property of a quadrilateral,

$$x + 5x + x + 5x = 360$$

$$\Rightarrow 12x = 360^\circ$$

$$\Rightarrow x = \frac{360}{12} = 30^\circ$$

Hence, the required angles are 30° , 150° , 30° and 150° .

EXERCISE- 13B

1. Do yourself.

2. Do yourself.

3. Do yourself.

4. Fill in the blanks :

(i) A triangular prism has **5** faces, **9** edges and **6** vertices.

(ii) A pyramid has **4** faces, **4** vertices and **6** edges.

(iii) A parallelogram having all sides equal is called a **rhombus**.
(rhombus square)

MULTIPLE CHOICE QUESTIONS

1. A square is a rhombus, a rectangle, a parallelogram.

Hence, the correct option is (d).

2. The quadrilateral in which the diagonals are equal and are perpendicular bisector is a square.

Hence, the correct option is (b).

3. Two side of a quadrilateral are said to be opposite side, if they are not adjacent sides.

Hence, the correct option is (b).

4. A polygon is a simple closed plane figure formed by more than 2 line segments.

Hence, the correct option is (b).

5. An ice-cream cone is an example of a cone.

Hence, the correct option is (d).

6. A brick is an example of a cuboid.

Hence, the correct option is (b).

7. A football is an example of a sphere.

Hence, the correct option is (c).

8. A dice is an example of a cube.

Hence, the correct option is (b).

9. A cuboid has length, breadth and height,

Hence, the correct option is (d).



Circle



EXERCISE-14

1. Define the following terms :

(i) **Diameter** : A line segment with both its end points on the boundary of the circle and passing through the centre of the circle is called the diameter of the circle.

(ii) **Circumference** : The length of the boundary of a circle is called its circumference.

(iii) **Chord** : A line segment whose end points lie on the circle is called a chord of the circle. The diameter of a circle is the longest chord of the circle.

2. Name the following parts of the given circle :

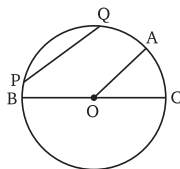
(i) Radius = OB , OC , OA

(ii) Diameter = BC

(iii) Chord = PQ , BC

(iv) Semi-circle = BRC , BQC

(v) Minor arc = \widehat{AC}



3. Give three examples from your daily life which have the shape of a circle.

Do yourself.

4. Draw a circle with radius:

(i) 3 cm = Do yourself.

(ii) 2 cm = Do yourself.

5. Find the diameter of a circle of radius :

(i) 5 cm

(ii) 2.8 cm

We know,

We know,

$$\text{Radius} = 5 \text{ cm}$$

$$\text{Radius} = 2.8 \text{ cm}$$

$$\text{Diameter} = 2 \times \text{radius}$$

$$\text{Diameter} = 2 \times \text{radius}$$

$$\therefore \text{Diameter} = 2 \times 5 \text{ cm}$$

$$\therefore \text{Diameter} = 2 \times 2.8 \text{ cm}$$

$$= 10 \text{ cm}$$

$$= 5.6 \text{ cm}$$

6. Fill in the blanks:

(i) A circle consists of an infinite number of **radii**.

(ii) All radii of a circle are **equal**.

(iii) The longest chord of a circle is known as **diameter**.

(iv) The boundary of a circle is known as its **circumference**.

(v) The path of a point equidistant from a **centre** point forms a circle.

MULTIPLE CHOICE QUESTIONS

1. If the diameter is 16 cm then radius is $\frac{16}{2} = 8 \text{ cm}$.

Hence, the correct option is (a).

2. Radius of circle = 14 cm then diameter = $2 \times \text{radius} = 2 \times 14 = 28 \text{ cm}$

Hence, the correct option is (d).

3. 12π is circumference of the circle of radius 6 cm.

Hence, the correct option is (c).

4. Diameter of a circle is $D = 2r$ (where D for diameter)

Hence, the correct option is (b).



Perimeter and Area



EXERCISE- 15A

1. Complete the table given below for a rectangular figure :

(i) Length = 24 cm, Breadth = ?, Perimeter = 76 cm

$$\text{Perimeter of a rectangular} = 2(l + b)$$

$$76 \text{ cm} = 2 \times l + 2 \times b$$

$$76 \text{ cm} = 2 \times 24 + 2 \times \text{breadth}$$

$$\text{Breadth} = \frac{76 - 48}{2} = \frac{28}{2} = 14 \text{ cm}$$

(ii) Length = ? , Breadth = 20 m, Perimeter = 140 m

Perimeter of a rectangular = $2 \times (l + b)$

$$140 \text{ m} = 2 \times (l + 20)$$

$$140 = 2l + 40$$

$$2 \times \text{length} = 140 - 40 = 100$$

$$\text{Length} = \frac{100}{2} = 50 \text{ m}$$

(iii) Length = 70 m, Breadth = 40 m, Perimeter = ?

Perimeter of a rectangular = $2 \times (l + b)$

$$= 2 \times (70 + 40)$$

$$= 2 \times 110 = 220 \text{ m}$$

2. Find the perimeter of each of the following figures :

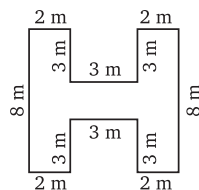
(i) Perimeter of the given figure

$$= 2\text{ m} + 3\text{ m} + 3\text{ m} + 3\text{ m} + 2\text{ m}$$

$$+ 8\text{ m} + 2\text{ m} + 3\text{ m} + 3\text{ m} + 3\text{ m}$$

$$+ 2\text{ m} + 8\text{ m}$$

$$= 42 \text{ m}$$

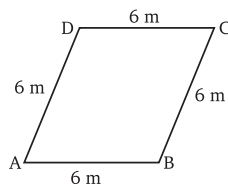


(ii) Perimeter of the given figure

$$= AB + BC + CD + DA$$

$$= 6\text{ m} + 6\text{ m} + 6\text{ m} + 6\text{ m}$$

$$= 24 \text{ m}$$



3. Mr. Kartik takes 2 rounds of a square park of side = 135 m

Perimeter of a square park = $4 \times \text{side of square}$

$$= 4 \times 135 \text{ m}$$

$$= 540 \text{ m}$$

Mr. Kartik covers distance = $2 \times 540 \text{ m}$

$$= 1080 \text{ m}$$

Aditya takes 3 rounds of a rectangular park of length = 70 m

breadth = 45 m

Perimeter of a rectangular park = $2 \times (l + b)$

$$= 2 \times (70 + 45)$$

$$= 2 \times 115 = 230 \text{ m}$$

Aditya covers distance = $3 \times 230 \text{ m} = 690 \text{ m}$

$$\therefore \text{Covers more distance} = 1080 \text{ m} - 690 \text{ m} \\ = 390 \text{ m}$$

\therefore Mr. Kartik covers more distance = 390 m

4. We know,

Sides of a triangular park = 120 m, 115 m and 120 m

Perimeter of a triangular = Sum of all sides

$$= 120 \text{ m} + 115 \text{ m} + 120 \text{ m} \\ = 355 \text{ m}$$

\therefore The total distance travelled by Kirti in four complete rounds of the park = $4 \times 355 \text{ m}$
= 1420 m

5. We know,

An equilateral triangle = 3 sides

\therefore Perimeter of an equilateral triangle

$$= 10 \text{ m } 40 \text{ cm}$$

$$= 1040 \text{ cm } (\because 1 \text{ m} = 100 \text{ cm})$$

Perimeter of an equilateral triangle = $3 \times \text{side}$

$$1040 = 3 \times \text{side}$$

$$\text{Side} = \frac{1040}{3}$$

$$\text{Side} = 346.66 \text{ cm (approx.)}$$

6. We know,

An equilateral triangle = $3 \times \text{side}$

$$\text{Perimeter} = 3 \text{ m } 12 \text{ cm} = 312 \text{ cm } (\because 1 \text{ m} = 100 \text{ cm})$$

Perimeter of equilateral triangle = $3 \times \text{side}$

$$\text{Side} = \frac{312}{3}$$

$$\text{Side} = 104 \text{ cm or } 1 \text{ m } 4 \text{ cm}$$

\therefore The length of a side of an equilateral triangle = 104 cm.

EXERCISE- 15 B

1. (i) Figure contains 2 complete squares and 4 half parts of square.

$$\text{So, its area} = \left[(2 \times 1) + \left(4 \times \frac{1}{2} \right) \right] \text{ sq. units}$$

$$= (2 + 2) \text{ sq. units}$$

$$= 4 \text{ sq. units}$$

(ii) Figure contains 6 complete squares and 4 half parts of square.

$$\begin{aligned}\text{So, its area} &= \left[(6 \times 1) + \left(4 \times \frac{1}{2} \right) \right] \text{sq. units} \\ &= (6 + 2) \text{sq. units} \\ &= 8 \text{sq. units}\end{aligned}$$

(iii) Figure contains 8 complete squares and 6 half parts of square.

$$\begin{aligned}\text{So, its area} &= \left[(8 \times 1) + \left(6 \times \frac{1}{2} \right) \right] \text{sq. units} \\ &= (8 + 3) \text{sq. units} \\ &= 11 \text{sq. units}\end{aligned}$$

(iv) Figure contains 8 complete squares and 4 half parts of square.

$$\begin{aligned}\text{So, its area} &= \left[(8 \times 1) + \left(4 \times \frac{1}{2} \right) \right] \text{sq. units} \\ &= (8 + 2) \text{sq. units} \\ &= 10 \text{sq. units}\end{aligned}$$

2. Size of stamps = 2 cm × 1.5 cm

Area of stamp = 3 cm

Size of a paper sheet = 6 m × 12 cm

Area of a paper sheet = 72 cm

$$\begin{aligned}\text{Number of stamps} &= \frac{\text{Area of a paper sheet}}{\text{Area of stamp}} \\ &= \frac{72\text{cm}}{3\text{cm}} \\ &= 24 \text{ stamps}\end{aligned}$$

3. Length of a rectangle = 25 m

Breadth of a rectangle = 16 m

$$\begin{aligned}\text{Area of a rectangle} &= \text{length} \times \text{breadth} \\ &= 25 \text{ m} \times 16 \text{ m} = 400 \text{ m}^2\end{aligned}$$

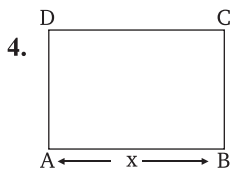
∴ Area of a rectangle = Area of a square

$$400 \text{ m}^2 = \text{Side} \times \text{Side}$$

$$(\text{Side})^2 = 400 \text{ m}^2$$

$$\text{Side} = \sqrt{400 \text{ m}^2}$$

$$\text{Side} = 20 \text{ m}$$



Square with side ' x '

$$\begin{aligned}\text{Area of the original square} &= \text{side} \times \text{side} \\ &= x \times x = x^2\end{aligned}$$

(i) If side is halved, then

$$\text{New side} = \frac{x}{2}$$

$$\begin{aligned}\text{New area of the square} &= \frac{x}{2} \times \frac{x}{2} = \frac{x^2}{4} \\ &= \frac{1}{4} \times \text{area of the original square}\end{aligned}$$

(ii) If side is doubled, we have

$$\text{Then, New side} = 2x$$

$$\begin{aligned}\text{New area of the square} &= 2x \times 2x = 4x^2 \\ &= 4 \times \text{area of the original square}\end{aligned}$$

5. Length of a garden = 53 m

Breadth of a garden = 45 m

$$\begin{aligned}\text{Area of a garden} &= \text{length} \times \text{breadth} \\ &= 53 \text{ m} \times 45 \text{ m} \\ &= 2385 \text{ m}^2\end{aligned}$$

$$\therefore \text{The cost of levelling a garden} = ₹ 40 \text{ per m}^2$$

$$\begin{aligned}\therefore \text{Total cost of levelling a garden} &= ₹ (40 \times 2385) \\ &= ₹ 95400\end{aligned}$$

6. Length of a room = 13 m

Breadth of a room = 10 m

$$\begin{aligned}\text{Area of a room} &= \text{length} \times \text{breadth} \\ &= 13 \text{ m} \times 10 \text{ m} \\ &= 130 \text{ m}^2\end{aligned}$$

$$\therefore \text{Cost of carpeting the floor} = ₹ 650 \text{ per m}^2$$

$$\begin{aligned}\therefore \text{Total cost of carpeting the floor} &= ₹ (650 \times 130) \\ &= ₹ 84500\end{aligned}$$

7. Area of a rectangle = 150 m^2

Length = 15 m

Area of a rectangle = length \times breadth

$150 \text{ m}^2 = 15 \text{ m} \times \text{breadth}$

Breadth = $\frac{150 \text{ m}^2}{15 \text{ m}} = 10 \text{ m}$

Perimeter of a rectangle = $2 \times (l + b)$

$= 2 \times (15 + 10)$

$= 2 \times 25 = 50 \text{ m}$

8. Size of tile = $4 \text{ m} \times 2.5 \text{ m}$

Area of tile = $4 \text{ m} \times 2.5 \text{ m} = 10 \text{ m}^2$

Length of a rectangular room = 45 m

Breadth of a rectangular room = 22 m

Area of a rectangular room = $45 \text{ m} \times 22 \text{ m}$

$= 990 \text{ m}^2$

Number of tiles = $\frac{\text{Area of a rectangular room}}{\text{Area of tile}}$

$= \frac{990 \text{ m}^2}{10 \text{ m}^2} = 99 \text{ tiles}$

\therefore Cost of 1 tile = ₹ 35

\therefore Cost of 99 tiles = ₹ (35×99) = ₹ 3465

Hence, the cost of all tiles is ₹ 3465.

MULTIPLE CHOICE QUESTIONS

1. The total cost of flooring a room at ₹ 8.50 per sq m is ₹ 510. If the length of the room is 8 m, its breadth is 7.5 m.

Hence, the correct option is (b).

2. The ratio of the areas of two squares, where the diagonal of one square is twice the length of the other, is 4 : 1.

3. If the sides of a square are halved, then its area becomes half.

Hence, the correct option is (b).

4. The perimeter of a rectangle of an area 650 cm^2 whose breadth is 13 cm is 126 cm .

Hence, the correct option is (c).

5. A marble tile measures $25 \text{ cm} \times 20 \text{ cm}$. The number of tiles required to cover a wall of size $4 \text{ m} \times 3 \text{ m}$ is 240 .

Hence, the correct option is (b).

6. The area of a rectangular garden 50 m long is 300 sq m. Its width is 6m.

Hence, the correct option is (b).

7. The cost of fencing a square park of side 50 m^2 at the rate of ₹ 20 per m^2 is ₹ 50,000.

Hence, the correct option is (d).

8. If each side of a regular octagon is a , then its perimeter is $8a$.

Hence, the correct option is (d).



Constructions



EXERCISE 16-A

Do yourself.

EXERCISE 16-B

Do yourself.

MULTIPLE CHOICE QUESTIONS

1. Two planes intersect in a line.

Hence, the correct option is (b).

2. $\frac{3}{2}$ right angles = 135°

Hence, the correct option is (b).

3. The vertex of an angle lie on the angle.

Hence, the correct option is (c).

4. An angle measuring 270° is a reflex angle.

Hence, the correct option is (d).

5. A line has no end point.

Hence, the correct option is (c).

6. A ray has one end point.

Hence, the correct option is (b).

7. A line segment has two end points.

Hence, the correct option is (a).



Data Handling



EXERCISE 17

1. Arrange the above data in an ascending order :

115, 116, 116, 116, 116, 116, 116, 116, 117, 117, 117, 118, 118, 119, 119, 119, 119, 120, 120, 120, 121, 121, 121, 121, 122, 123, 123, 124, 124, 125, 125, 125

Number of students	Tally Marks	Number of classes (Frequency)
115		1
116		7
117		3
118		2
119		4
120		3
121		4
122		1
123		2
124		2
125		3

2. Arrange weights of ascending order :

25, 25, 27, 27, 28, 28, 28, 28, 28, 29, 29, 31, 31, 31, 32, 32, 32, 32, 34, 34


Weight of Marbles (in grams)	Tally Marks	Number of marbles
25		2
27		2
28		5
29		2
31		3
32		4
34		2

3. (a) Tuesday, number of cars = $9 \times 5 = 45$

$$\begin{aligned}
 \text{(b) Total number of cars} &= (7 + 9 + 6 + 4 + 5 + 7 + 2) \times 5 \\
 &= 40 \times 5 \\
 &= 200
 \end{aligned}$$

4. (a) 360 balls
- (b) 80 balls
- (c) 100 balls
- (d) Fourth week, 60 balls
- (e) Third week, 120 balls

MULTIPLE CHOICE QUESTIONS

1.  is represents the number eight.
Hence, the correct option is (c).
2. The marks (out of 10) obtained by 28 students in mathematics test are listed as below:
8, 1, 2, 6, 5, 5, 5, 0, 1, 9, 7, 8, 0, 5, 8, 3, 0, 8, 10, 10, 3, 4, 8, 7, 8, 9, 2, 0
The number of students who obtained marks more than or equal to 5 is 17.
Hence, the correct option is (d).
3. A pictograph represents data through **pictures** of objects.
Hence, the correct option is (a).