

NEW BHARATH MATRICULATION HIGHER SECONDARY SCHOOL,
TIRUVARUR

7th Standard

MATHS KEY ANSWER

CHAPTER – 1

NUMBER SYSTEM

Exercise - 1.1

1. Fill in the blanks:

(i) $(-30) + \underline{90} = 60$

(ii) $-5 - \underline{95} = -100$

(iii) $(-52) + (-52) = \underline{-104}$

(iv) $22 + (-22) = 0$

(v) $140 + (-70) = 70$

(vi) $20 + 80 + (-100) = 0$

(vii) $75 + (-25) = 50$

(viii) $171 + (-171) = 0$

(ix) $(-3) + (-12) + (-77) = \underline{-3} + [(-12) + (-77)]$

(x) $(-42) + [\underline{15} + (-23)] = [(\underline{-42}) + 12] + (\underline{-23})$

2. Say true or false:

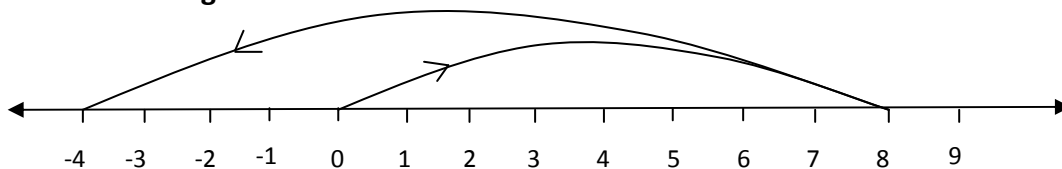
(i) The additive inverse of (-32) is (-32) - False

(ii) $(-90) + (-30) = 60$ - False

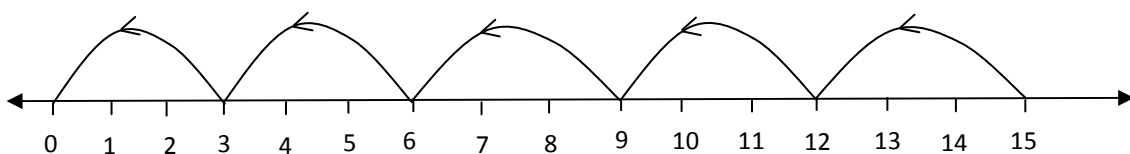
(iii) $(-125) + 25 = -100$ - True

3. Add the following:

(i) 8 and -12 using number line.



(ii) (-3) and (-5) using number line



(iii) $(-100) + (-10) = -110$

(iv) $20 + (-72) = -52$

(v) $82 + (-75) = 7$

(vi) $-48 + (-15) = -63$

(vii) $(-225) + (-63) = -288$

4. Thenmalar appeared for competitive exam which has negative scoring of 1 mark for each incorrect answer. In paper I she answered 25 questions incorrectly and in paper II, 13 questions incorrectly. Find the total reduction of marks.

Thenmalar scored for each incorrect answer = -1

In paper I, her incorrect answer = 25 = -25 mark

$$\begin{array}{r} \text{In paper II, her incorrect answer} = 13 = -13 \\ \hline = -38 \\ \hline \end{array}$$

Total reduction of marks = -38

5. In a quiz competition, Team A scored +30, -20, 0 and team B scored -20, 0, +30 in three successive rounds. Which team will win? Can we say that we can add integers in any order?

$$\text{Team A} = 30 - 20 + 0 = 10$$

$$\text{Team B} = -20 + 0 + 30 = 10$$

$$\text{Team A} = \text{Team B}$$

6. Are $(11+7)+10$ and $11+(7+10)$ and equal? Mention the property.

Both are equal

$$(11+7)+10 = 11+(7+10)$$

Associative property

7. Find 5 pairs of integers that add up to 2.

$$0+2, 1+1, -1+3, -2+4, -3+5 \text{ (any pair)}$$

8. The temperature at 12 noon at a certain place was 18° above zero. If it decreases at the rate of 3° per hour at what time it would be 12° below zero?

10 pm

9. Identify the problem with negative numbers as its answer:

- (i) $-9 + (-5) + 6$
- 10. $(-10) + (7) = \underline{-3}$
- 11. $-8 + 10 - 2 = \underline{0}$
- 12. $20 + (-9) + 9 = \underline{20}$

Subtractions of Integers

Exercise - 1.2

1. Fill in the blanks:

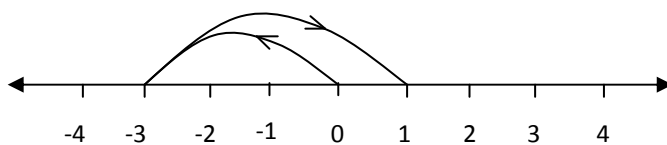
- (i) $-44 + (-44) = -88$
- (ii) $\underline{30} - 75 = -45$
- (iii) $\underline{(-30)} - (50) = -80$

2. Say true or false:

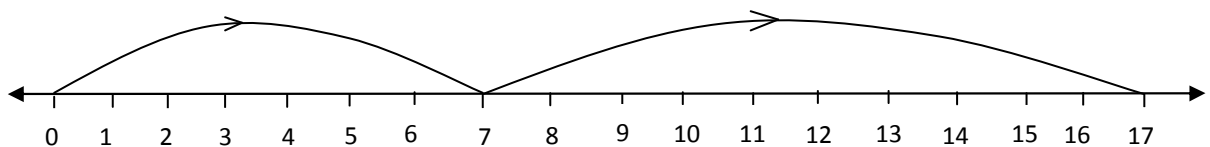
- (i) $(-675) - (-400) = -1075$ - False
- (ii) $15 - (-18)$ is same as $15 + 8$ - True
- (iii) $-45 - (-8) = -8 - (-45)$ - False

3. Find the value of the following:

(i) $-3 - (-4)$ using number line



(ii) $7 - (-10)$ using number line



(iii) $35 - (-64) = 99$

(iv) $-200 - (+100) = -300$

4. Kabilan was having 10 pencils with him. He gave 2 pencils to Senthil and 3 to Karthik. Next day his father gave him 6 more pencils, from that he gave 8 to his sister. How many pencils are left with him?

$$10 - 2 - 3 + 6 - 8 = 3 \text{ pencils}$$

5. A lift is on the ground floor. If it goes 5 floors down and then moves up to 10 floors from there. Then in which floor will the lift be?

$$-5 + 10 = 5^{\text{th}} \text{ floor. Above the ground.}$$

6. When Kala woke up, her body temperature was 102°F . She took medicine for fever. After 2 hours it was 2°F lower. What was her temperature then?

$$102^{\circ}\text{F} - 2^{\circ}\text{F} = 100^{\circ}\text{F}$$

7. What number should be added to (-17) to get (-19) ?

$$x - 17 = -19$$

$$x = -19 + 17$$

$$x = -2$$

8. A student was asked to subtract (-12) from (-47) . He got Is he correct? Justify.

$$-47 - (-12) = -47 + 12 = -35$$

-30 is wrong answer. -35 is correct answer.

Objective types question:

9. $-5 - (-18) = 13$

10. $(-100) - 0 + 100 = 0$

Multiplication of integers

Exercise - 1.3

1. Fill in the blanks:

(i) $-80 \times \underline{1} = -80$

(ii) $-10 \times \underline{-2} = 20$

(iii) $100 \times \underline{-5} = -500$

(iv) $\underline{5} \times (-9) = -45$

(v) $\underline{0} \times 75 = 0$

2. Say True or False:

(i) $-15 \times 5 = 75$ – False

(ii) $-100 \times 0 \times 20 = 0$ – True

(iii) $8 \times (-4) = 32$ - False

3. What will be the sign of the product of the following?

(i) 16 times of negative integers

+ve i.e. $(-)^{16} = +ve$

(ii) 29 times of negative integers

-ve i.e. $(-)^{29} = -ve$

4. Find the product of

(i) $-35 \times 22 = -770$

(ii) $-10 \times 12 \times -9 = 720$

(iii) $(-9) \times (-8) \times (-7) \times (-6) = 3024$

(iv) $(-25) \times 0 \times 45 \times 90 = 0$

(v) $(-2) \times 50 \times (-25) \times 4 = 100 \times -100 = 10000$

5. Check the following

(i) $(8 - 13) \times 7$ and $8 - (13 \times 7)$

-5×7 and $8 - 91$

-35 and -83 (not equal)

Distributive property of multiplication over addition.

(ii) $[(-6) - (+8)] \times (-4)$ and $(-6) - [8 \times (-4)]$

-14×-4 and $-6 - (-32)$

56 and $-6 + 32$

56 and 26 (not equal)

Distributive property of multiplication over addition.

(iii) $3 \times [(-4) + (-10)]$ and $[3 \times (-4) + 3 \times (-10)]$

$$3(-14) \text{ and } [-12 - 30]$$

$$-42 \text{ and } -42 \text{ (equal)}$$

Distributive property of multiplication over addition.

6. During summer, the level of the water in a pond decreases by 2 inches every week due to evaporation. What is the change in the level of the water over a period of 6 weeks?

The level of the water in a pond decreases by 2 inches. Every week due to evaporation the change in the level of the water over a period of 6 weeks = $2 \times 6 = 12$ inches

7. Find all possible pairs of integers that give a product of -50

$$-5 \times 10 = -50$$

$$-10 \times 5 = -50$$

$$2 \times (-25) = -50$$

$$(-2) \times 25 = -50$$

$$(-1) \times 50 = -50$$

$$(-50) \times 1 = -50$$

Objective type questions

8. Which of the following expressions is equal to -30.

$$-6 \times (5) = -30$$

9. Which property is illustrated by the equation: $(5 \times 2) + (5 \times 5) = 5 \times (2 + 5)$

Distributive

10. $11 \times (-1) = \underline{-11}$

11. $(-12) \times (-9) = \underline{108}$

Division of Integers

Exercise 1.4

An integer divided by zero is meaningless. But zero divided by a non-zero integer is zero.

1. Fill in the blanks:

(i) $(-40) \div (-1) = 40$

(ii) $25 \div \underline{-5} = -5$

(iii) $\underline{-36} \div (-4) = 9$

(iv) $(-62) \div (-62) = \underline{1}$

2. Say True or False:

(i) $(-30) \div (-6) = -6$ – False

(ii) $(-64) \div (-64)$ is 0 – False

3. Find the values of the following:

(i) $(-75) \div 5 = -15$

(ii) $(-100) \div (-20) = 5$

(iii) $45 \div (-9) = -5$

(iv) $(-82) \div 82 = -1$

4. The product of two integers is -135 . If one number is -15 , Find the other integer.

$$xy = -135$$

$$(-15)y = -135$$

$$Y = \frac{-135}{-15} = 9 \text{ (another number)}$$

5. In 8 hours duration, with uniform decrease in temperature, the temperature dropped 24° . How many degrees did the temperature drop each hour?

$$\text{The temperature dropped} = 24^\circ$$

$$\text{Duration} = 8 \text{ hours}$$

$$\text{The temperature dropped each hours} = \frac{24}{8} = 3^\circ$$

6. An elevator descends into a mine shaft at the rate of 5 m/min. If the descent starts from 15 m above the ground level, how long will it take to reach -250 m?

If the descent starts from 15m above the ground level,

The time taken to reach -250 = +250 + 15 = 265

An elevator descends into a mine shaft at the rate of 5 m/min

$$= \frac{265}{5} = 53 \text{ minutes}$$

7. A person lost 4800 calories in 30 days. If the calory loss is uniform, calculate the loss of calory per day.

A person lost 4800 calories in 30 days

The loss of calory per day = $\frac{4800}{30} = 160$

8. Given $168 \times 32 = 5376$ then find $(-5376) \div (-32)$.

$$168 \times 32 = 5376$$

$$\frac{5376}{32} = 168$$

9. How many $(-\square)$'s are there in (-20) ?

$$\underline{-5}$$

10. (-400) divided into 10 equal parts gives

$$\frac{-400}{10} = -40$$

Objective type questions:

11. Which of the following does not represent an integer?

$$(12) \div 5$$

12. $(-16) \div 4$ is the same as

$$(16) \div (-4)$$

13. $(-200) \div 10$ is

-20

14. The set of integers using all fundamental operations

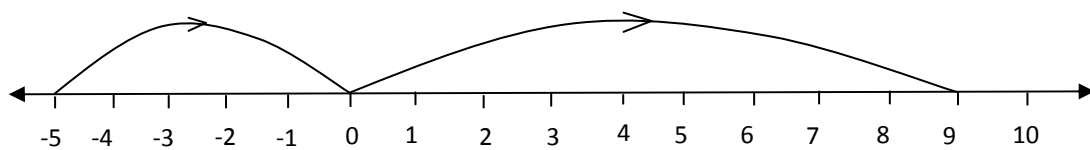
Division

Statement Problems on Integers using all Fundamental Operations.

Exercise 1.5

1. One night in Kashmir, the temperature is -5°C . Next day the temperature is 9°C . What is the increase in temperature?

$+5^{\circ}\text{C} + 9^{\circ}\text{C} = 14^{\circ}$ increases in temperature



2. An atom can contain protons which have a positive charge (+) and electrons which have a negative charge (-). When an electron and a proton pair up, they become neutral (0) and cancel the charge out. Now, determine the net charge:

Proton = +ve (+)

Electron = -ve (-)

When an electron and a proton pair up, they become neutral (0) and change out. Now, determine the net charge.

(i) 5 electron and 3 proton $\rightarrow -5 + 3 = -2$

That is 2 electrons $\ominus \ominus$

(ii) 6 protons and 6 electrons $\rightarrow -6 + 6 = 0$

(iii) 9 protons and 12 electrons $\rightarrow +9 - 12 = -3$

That is 3 electrons $\ominus \ominus \ominus$

(iv) 4 protons and 8 electrons $\rightarrow +4 - 8 = -4$

That is 4 electrons $\ominus \ominus \ominus \ominus$

(v) 7 protons and 6 electrons $\rightarrow +7 - 6 = 1$

That is 1 proton \oplus

3. Scientists use the Kelvin scale (k) as an alternative temperature scale to degrees Celsius ($^{\circ}\text{C}$) by the relation $T^{\circ}\text{C} = (T + 273) \text{ K}$

Convert the following to Kelvin

(i) -275°C use $T^{\circ}\text{C} = (T + 273) \text{ K}$

$$T^{\circ}\text{C} = -275 \text{ K}$$

(ii) $T^{\circ}\text{C} = 45^{\circ} + 73 = 318 \text{ K}$

(iii) $T^{\circ}\text{C} = -400^{\circ}\text{C} + 273 = 127 \text{ K}$

(iv) $T^{\circ}\text{C} = -273 + 273 = 0 \text{ K}$

4. Find the amount that is left in the student's bank account, if he has made the following transaction in a month. His initial balance is Rs. 690.

(i) Deposit of Rs. 485

Deposit = (+)

$$690 + 485 = \text{Rs. } 1175$$

Withdrawal = (-)

(ii) Withdrawal of Rs. 500

$$1175 - 500 = \text{Rs. } 675$$

(iii) Withdrawal of Rs. 350

$$675 - 350 = \text{Rs. } 325$$

(iv) Deposit of Rs. 89

$$325 + 89 = \text{Rs. } 414$$

(v) If another Rs. 300 was withdrawn, what would the balance be?

$$414 - 300 = \text{Rs. } 114$$

5. A poet Tamizh Nambi lost 35 pages of his 'lyrics' when his file had got wet in the rain. Use integers, to determine the following:

(i) If Tamizh Nambi wrote 5 page per day, how many day's work did he lose?

$$\frac{35}{5} = 7 \text{ days}$$

(ii) If four pages contained 1800 characters, (letters) how many characters were lost?

$$1 \text{ page contain } \frac{1800}{4} = 450 \text{ characters}$$

$$5 \text{ pages contain } 450 \times 5 = 2250 \text{ characters}$$

(iii) If Tamizh Nambi is paid Rs.250 for each page produced, how much money did he lose?

35 pages lost

Each page lost Rs. 250

$$\text{The money he lost} = 250 \times 35 = \text{Rs. } 8750$$

(iv) If Kavimaan helps Tamizh Nambi and they are able to produce 7 pages per day, how many days will it take to recreate the work lost?

$$\frac{35}{7} = 5 \text{ days}$$

(v) Tamizh Nambi pays kavimaan Rs. 100 per page for his help. How much money does kavimaan receive?

$$100 \times 35 = \text{Rs. } 3500$$

6. Add 2 to me. Then multiply by 5 and subtract 10 and divide now by 4 and I will give you 15! Who am I?

$$(x + 2) \times 5 - 10/4 = 15$$

$$5x + 10 - 10 \div 4 = 15$$

$$5x/4 = 15$$

$$X = 15 \times 4/5 = 12$$

7. Kamatchi, a fruit vendor sells 30 apples and 50 pomegranates. If she makes a profit of Rs. 8 per apple and loss Rs. 5 per pomegranate, what will be her overall profit(or)loss?

Profit (+)

Profit Rs. 8 per apple = +8

Loss Rs. 5 Per pomegranate = -5

Entire transaction

$$30 (+8) + 50 (-5) = 240 - 250 = -10 \text{ loss}$$

8. During a drought, the water level in a dam fell 3 inches per week for 6 consecutive weeks. What was the change in the water level in the dam at the end of this period?

The water level in a dam fell 3 inches per week.

For 6 consecutive weeks, the change in the water level = $3 \times 6 = 18$ inches

Decreases of 18 inches

9. Buddha was born in 563 BC(BCE) and died in 483 BC(BCE). Was he alive in 500 BC(BCE)? and find his life time.

Yes $483 - 563 = 80$ years

Miscellaneous Practice problems

Exercise 1.6

1. What should be added -1 to get 10?

$$-1 + x = 10$$

$$x = 10 + 1 = 11$$

2. $-70 + 20 = \underline{-40}$ -10

3. Subtract 94860 from (-86945)

$$-86945 - 94860$$

$$= -181805$$

4. Find the value of $(-25) + 60 + (-95) + (-385)$

$$-445$$

5. Find the sum of (-9999) (-2001) and (-5999)

17999

6. Find the product of (-30) x (-70) x 15

31500

7. Divide (-72) by 8

$$\frac{-72}{8} = -9$$

8. Find two pairs of integers whose product is 15

(-3, -5) (3, 5)

9. Check the following for equality

(i) (11 + 7) + 10 and 11 + (7 + 10)

17 + 10 and 11 + 17

27 and 27 (equal)

(ii) (8 - 13) x 7 and 8 - (13 x 7)

-5 x 7 and 8 - 91

-35 and -83 (not equal)

(iii) [(-6) - (8)] x (-4) and (-6) - [8 x (-4)]

-14 x -4 and -6 + 32

56 and 26 (not equal)

(iv) 3 x [(-4) + (-10)] and [3 x (-4) + 3 x (-10)]

3 x -14 and -12 + (-30)

-42 and -42 (equal)

10. Kalaivani had Rs. 5000 in her bank account on 01.01.2018. She deposited Rs. 2000 in January and withdrew Rs. 700 in February. What was Kalaivani's bank balance on 01.04.2018, if she deposited Rs. 1000 and withdrew Rs. 500 in March?

Kalaivani had an bank account = Rs. 5000

Deposited = Rs. 2000 (January)

Withdraw = Rs. 700 (February)

Deposited = Rs. 1000 (March)

Withdraw = Rs. 500 (March)

$$= 5000 + 2000 + 1000 - (700+500)$$

$$= 8000 - 1200$$

$$= \text{Rs. } 6800$$

11. The price of an item x increases by Rs. 10 every year and an item y decreases by Rs. 15 every year. If in 2018, the price of x is Rs. 50 and y is Rs. 90, then which item will be costlier in the year 2020.

x + 10 increases every year

y – 15 decreases every year

$$\left. \begin{array}{l} x = \text{Rs. } 50 \\ y = \text{Rs. } 90 \end{array} \right\} \text{ in 2018}$$

In 2020, $x + 30 = 50 + 30 = \text{Rs. } 80$

$$Y - 15 = 90 - 45 = 45$$

X item is costlier than y.

12. Match the statement bin column A and column B.

Column A	Column B
(i) For any two integers 72 and 108, $72 + 108$ is also an integers	Closed under addition
(ii) For any three integers 68, 25 and 99 $68 \times (25 + 99) - (68 \times 25) + (68 \times 99)$	Distributive of multiplication over addition
(iii) $0 + (-138) = -138 = (-138) + 0$	Additive identity
(iv) For any two integers (-5) and 10 $(-5) \times 10 = 10 \times (-5)$	Commutative property under multiplication
$1 \times (-1098) = (-1098) = (-1098)$	Multiplicative identity

CHAPTER – 2

MEASUREMENTS

Formula's required:

The perimeter of a rectangle = $2(l + b)$ units

The perimeter of a square = $4 \times a$ units

Area of a rectangle = $l \times b$ sq. units

Area of a square = $a \times a$ sq. units

Area of the right angled triangle = $\frac{1}{2}(b \times h)$ sq. units

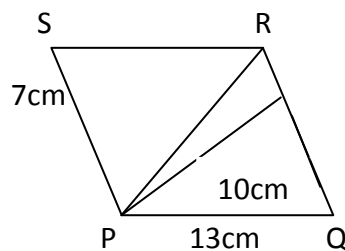
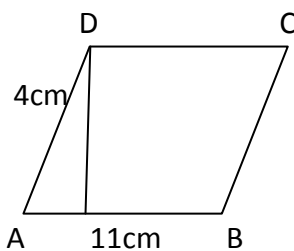
Area of parallelogram = $b \times h$

Area of rhombus = $\frac{1}{2} d_1 \times d_2$

Area of trapezium = $\frac{1}{2}(a + b) h$

Exercise 2.1

1. Find the area and perimeter of the following parallelograms.



(i) Area of the parallelogram $b \times h = 11 \times 3 = 33 \text{ cm}^2$

Perimeter = $2(11 + 4) = 2(15) = 30 \text{ cm}$

(ii) Area $b \times h = 7 \times 10 = 70 \text{ Sq.cm}$

Perimeter = $2(l + b) = 2(13 + 7) = 2(20) = 40 \text{ cm}$

2. Find the missing values.

S. No	Base	Height	Area
1.	18 cm	5 cm	90 sq.m
2.	8 m	7 m	56 sq.m
3.	13 m	17 mm	221 sq.mm

Area of parallelogram = $b \times h$

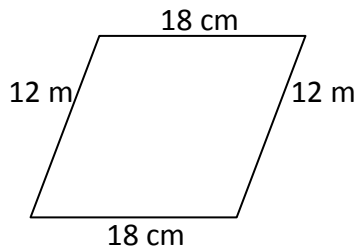
3. Suresh won a parallelogram-shaped trophy in a state level Chess tournament. He knows that the area of the trophy is 735 sq. cm and its base is 21 cm. What is the height of that trophy?

$$\text{Area of the parallelogram } A = b \times h$$

$$735 \text{ sq.cm} = 21 \times h$$

$$h = \frac{735}{21} = 35 \text{ cm}$$

4. Janaki has a piece of fabric in the shape of a parallelogram. Its height is 12 m and its base is 18 m. She cuts the fabric into four equal parallelograms by cutting the parallel sides through its mid-points. Find the area of each new parallelogram.



$$\text{Area of the parallelogram} = b \times h = 18 \times 12 = 216$$

$$4 \text{ equal parts} = 216/4 = 54 \text{ m}$$

5. A ground is in the shape of parallelogram. The height of the parallelogram is 14 metres and the corresponding base is 8 metres longer than its height. Find the cost of levelling the ground at the rate of ` 15 per sq. m.

$$\text{Area of the parallelogram } A = bh$$

$$h = 14 \text{ m}$$

$$b = 8 \text{ m} + h = 8 + 14 = 22 \text{ m}$$

$$\text{Area of the ground} = bh = 14 \times 22 = 308 \text{ m}^2$$

The cost of travelling the ground at the rate of Rs. 15 sq. m = $308 \times 15 = \text{Rs. } 4620$

Objective type questions

6. The perimeter of a parallelogram whose adjacent sides are 6cm and 5cm is

$$\text{Perimeter} = 6 \text{ cm} + 6 \text{ cm} + 5 \text{ cm} + 5 \text{ cm} = 22 \text{ cm}$$

7. The area of a parallelogram whose base 10 m and height 7m is

$$\text{Area} = 10 \times 7 = 70 \text{ m}^2$$

8. The base of the parallelogram with area is 52 Sq. Cm and height 4 cm is

$$\text{Area } bh = 52, \quad h = 4 \text{ cm}$$

$$52/4 = 13 \text{ cm}$$

9. What happens to the area of the parallelogram, if the base is increased 2 times and the height is halved?

$$A = bh = 2b \times h/2 = bh$$

Remains the same

10. In a parallelogram, the base is three times its height. If the height is 8 cm. Then the area is

$$b = 3h = 3(8) = 24 \text{ cm} \quad h = 8 \text{ cm}$$

$$\text{Area} = 24 \times 8 = 192 \text{ sq. cm}$$

Rhombus

Exercise 2.2

Area of rhombus = $\frac{1}{2} d_1 \times d_2$

1. Find the area of rhombus PQRS shown in the following figures

(i) $d_1 = 8 \text{ cm}, d_2 = 16 \text{ cm}$

$$\text{Area} = \frac{1}{2} 8 \times 16 = 64 \text{ sq. unit}$$

(ii) $A = b \times h = 15 \times 11 = 165 \text{ sq. unit}$

2. Find the area of rhombus whose base is 14 cm and height is 9 cm

$$\text{Area} = bh = 14 \times 9 = 126 \text{ Sq. cm}$$

3. Find the missing value

(i) $\frac{1}{2} 19 \times 16 = 152$

(ii) $d_2 = 468/26 = 18$

(iii) $d_1 = 180/12 = 15$

4. The area of a rhombus is 100 sq. cm and length of one of its diagonals is 8 cm. Find the length of the other diagonal.

$$A = \frac{1}{2} d_1 \times d_2 = 100 \times 2 / 8 = d_2$$

$$d_2 = 25 \text{ cm}$$

5. A sweet is in the shape of rhombus whose diagonals are given as 4 cm and 5 cm. The surface of the sweet should be covered by an aluminum foil. Find the cost of aluminum foil used for 400 such sweets at the rate of ` 7 per 100 sq. cm.

$$\text{Area of sweet} = \frac{1}{2} 4 \times 5 = 20/2 = 10 \text{ cm}^2$$

The cost of aluminium foil used for 400 such sweets at the rate of Rs. 7 per 100 sq. cm

$$= \frac{400 \times 7}{10} = \text{Rs. } 280$$

Objective type questions

6. The area of the rhombus with side 4 cm and height 3 cm is 12 Sq. cm
7. The area of the rhombus when both diagonals measuring 8 cm is 32 sq. cm
8. The area of the rhombus is 128 sq. cm and the length of one diagonal is 32 cm. The length of the other diagonal is 8 cm
9. The height of the rhombus whose area 96 sq. m and side 24 m is 4 cm
10. The angle between the diagonals of a rhombus is 90°

Exercise 2.3

1. Find the missing values

(i) $h = 10 \text{ m}$, $a = 12 \text{ m}$, $b = 20 \text{ m}$

$$\text{Area} = \frac{1}{2} (a + b) h = \frac{1}{2} (12 + 20) \times 10 = 32 \times 5 = 160 \text{ cm}^2$$

(ii) $h = x$, $d = 13 \text{ cm}$, $b = 28 \text{ cm}$, $\text{Area} = 492 \text{ sq. cm}$

$$\frac{1}{2} (a + b) x = A \Rightarrow (492 \times 2) = (13 + 28) x \Rightarrow x = 986/41 = 24 \text{ cm}$$

(iii) $h = 19 \text{ m}$, $a = ?$, $b = 16 \text{ m}$, $\text{Area} = 323 \text{ sq. m}$

$$323 = \frac{1}{2} (a+16)19$$

$$323 \times 2 = 19 a + 304$$

$$342 = 19 a \Rightarrow a = 18 \text{ m}$$

(iv) $h = 16$ cm, $a = 15$ cm, $b = ?$, $A = 360$ sq.cm

$$A = \frac{1}{2} (a + b) h$$

$$360 = \frac{1}{2} (15 + b) \times 16$$

$$360 = 15 \times 8 + 8b$$

$$360 - 120 = 8b$$

$$8b = 240$$

$$b = 30 \text{ cm}$$

2. Find the area of a trapezium whose parallel sides are 24 cm and 20 cm and the distance between them is 15 cm.

$$A = \frac{1}{2} (a + b) h = \frac{1}{2} (24 + 20) \times 15$$

$$= \frac{1}{2} 44 \times 15 = 15 \times 22 = 330 \text{ cm}^2$$

3. The area of a trapezium is 1586 sq. cm. The distance between its parallel sides is 26 cm. If one of the parallel sides is 84 cm then, find the other side.

$$A = \frac{1}{2} (a + b) h \Rightarrow 1568 = \frac{1}{2} (a + 84) \times 26$$

$$1568 = 13 a + 13 \times 84$$

$$1586 = 13 a + 1092$$

$$494 = 13 a$$

$$a = 38 \text{ cm}$$

4. The area of a trapezium is 1080 sq. cm. If the lengths of its parallel sides are 55.6 cm and 34.4 cm, find the distance between them.

$$A = \frac{1}{2} (a + b) h \Rightarrow 1080 = \frac{1}{2} (55.6 + 34.4) \times h$$

$$1080 \times 2 = 100 \times h$$

$$h = \frac{216}{10} = 21.6 \text{ cm}$$

5. The area of a trapezium is 180 sq. cm and its height is 9 cm. If one of the parallel sides is longer than the other by 6 cm, find the length of the parallel sides.

$$A = \frac{1}{2} (a + b) h \Rightarrow 180 = \frac{1}{2} (x + x + 6) \times 9$$

$$180 \times 2 = (2x + 6) 9$$

$$360 = 18x + 54$$

$$360 - 54 = 18x$$

$$\frac{360}{18} = x \Rightarrow x = 17 \text{ cm}$$

$$x + 6 = 24 \text{ cm} \quad (\text{other side})$$

6. The sunshade of a window is in the form of isosceles trapezium whose parallel sides are 81 cm and 64 cm and the distance between them is 6 cm. Find the cost of painting the surface at the rate of Rs. 2 per sq. cm.

$$A = \frac{1}{2} (a + b) h = \frac{1}{2} (81 + 64) \times 6$$

$$145 \times 3 = 435 \text{ cm}^2$$

$$\text{Cost of painting} = 435 \times 2 = \text{Rs. } 870$$

7. A window is in the form of trapezium whose parallel sides are 105 cm and 50 cm respectively and the distance between the parallel sides is 60 cm. Find the cost of the glass used to cover the window at the rate of ` 15 per 100 sq. cm.

$$A = \frac{1}{2} (a + b) h = \frac{1}{2} (105 + 50) \times 60 = 155 \times 30 = 4650$$

$$\text{Cost} = \frac{4650}{100} \times 15 = \text{Rs. } 697.50$$

Objective type questions

8. The area of the trapezium, if the parallel sides are measuring 8 cm and 10 cm and the height 5 cm is 45 sq. cm

9. In a trapezium if the sum of the parallel sides is 10 m and the area is 140 sq. m, then the height is 28 cm

10. When the non-parallel sides of a trapezium are equal then it is known as isosceles trapezium.

Miscellaneous Practice problems

Exercise 2.4

1. The base of the parallelogram is 16 cm and the height is 7 cm less than its base. Find the area of the parallelogram.

$$\text{Area of parallelogram} = b \times h$$

$$b = 16 \text{ cm, height} = 16 - 7 = 9 \text{ cm}$$

$$\text{Area} = b \times h = 16 \times 9 = 144 \text{ cm}^2$$

2. An agricultural field is in the form of a parallelogram, whose area is 68.75 sq. hm. The distance between the parallel sides is 6.25 hm. Find the length of the base.

$$A = b \times h$$

$$b = \frac{68.75}{6.25} = 11 \text{ cm}$$

3. A square and a parallelogram have the same area. If the side of the square is 48 m and the height of the parallelogram is 18 m, find the length of the base of the parallelogram.

$$\text{Area of square} = a^2$$

$$\text{Area of parallelogram} = b \times h$$

$$a = 48 \text{ cm, height of the parallelogram} = 18 \text{ m, } b = ?$$

$$a^2 = 48 \times 48, = 18 \times b$$

$$b = \frac{48 \times 48}{18} = 128 \text{ m}$$

4. The height of the parallelogram is one fourth of its base. If the area of the parallelogram is 676 sq. cm, find the height and the base.

$$h = \frac{1}{4} b \quad A = 676 = bh$$

$$4h = b \quad 676 = 4h \times h$$

$$4h^2 = 676 \text{ cm}^2$$

$$h^2 = \frac{676}{4} = 169$$

$$h = 13 \text{ cm}$$

5. The area of the rhombus is 576 sq. cm and the length of one of its diagonal is half of the length of the other diagonal then find the length of the diagonals.

$$\text{Area of rhombus} = \frac{1}{2} d_1 d_2 = 576 \text{ sq. cm}$$

$$d_1 = \frac{1}{2} d_2 = 2 d_1 = d_2$$

$$A = \frac{1}{2} d_1 (2d_1) = 576$$

$$d_1^2 = 576 = d_1 = 24 \text{ cm}$$

6. A ground is in the form of isosceles trapezium with parallel sides measuring 42 m and 36 m long. The distance between the parallel sides is 30 m. Find the cost of levelling it at the rate of ` 135 per sq.m.

$$\text{Area} = \frac{1}{2} (a + b) h = \frac{1}{2} (42 + 36) \times 30 = 80 \times 15 = 1200 \text{ m}^2$$

Chapter – 3

Algebra

Exercise 3.1

1. Fill in the blanks:

- (i) The variable in the expression $16x - 7$ is x.
- (ii) The constant term of the expression $2y - 6$ is -6.
- (iii) In the expression $25m + 14n$, the type of the terms are unlike terms.
- (iv) The number of terms in the expression $3ab + 4c - 9$ is 3.
- (v) The numerical co-efficient of the term $-xy$ is -1.

2. Say True or False:

- (i) $x + (-x) = 0$. True
- (ii) The co-efficient of ab in the term $15abc$ is 15. False
- (iii) $2pq$ and $-7qp$ are like terms. True
- (iv) When $y = -1$, the value of the expression $2y - 1$ is 3. False

3. Find the numerical coefficient of each of the following terms:

$-3yx, 12k, y, 121bc, -x, 9pq, 2ab$

Numerical coefficient: -3, 12, 1, 121, -1, 9, 2

4. Write the variables, constants and terms of the following expressions

	Variables	Constants	Terms
$18 + x - y$	x, y	18	18, x, -y
$7p - 4q + 5$	P, q	5	7p, -4q, 5
$29x + 13y$	x, y	-	29x, 13y
$b + 2$	b	2	b, 2

5. Identify the like terms among the following: $7x, 5y, -8x, 12y, 6z, z, -12x, -9y, 11z$.

$7x, -8x, -12x$

$5y, 12y, -9y$

$6z, z, 11z$

6. If $x = 2$ and $y = 3$, then find the value of the following expressions

(i) $2x - 3y = 2(2) - 3(3) = 4 - 9 = -5$

(ii) $x + y = 2 + 3 = 5$

(iii) $4y - x = 4(3) - 2 = 12 - 2 = 10$

(iv) $x + 1 - y = 2 + 1 - 3 = 0$

Objective type questions

7. An algebraic statement which is equivalent to the verbal statement "Three times the sum of x and y " is $3(x+y)$.

8. The numerical co-efficient of $-7mn$ is -7

9. Choose the pair of like terms $-4x, 7x$

10. The value of $7a - 4b$ when $a = 3, b = 2$ is 13 .

Addition and Subtraction of Algebraic expressions

Exercise 3.2

1. Fill in the blanks:

(i) The addition of $-7b$ and $2b$ is $-5b$

(ii) The subtraction of $5m$ from $-3m$ is $-8m$

(iii) The additive inverse of $-37xyz$ is $+37xyz$

2. Say True or False:

(i) The expressions $8x + 3y$ and $7x + 2y$ can not be added. False

(ii) If x is a natural number, then $x + 1$ is its predecessor. False

(iii) Sum of $a - b + c$ and $-a + b - c$ is zero. True

3. Add:

(i) $8x, 3x = 8x + 3x = 11x$

(ii) $7mn, 5mn = 12mn$

(iii) $-9y, 11y, 2y = 4y$

4. Subtract:

(i) $4k$ from $12k = 12k - 4k = 8k$

(ii) $15q$ from $25q = 25q - 15q = 10q$

(iii) $7xyz$ from $17xyz = 17xyz - 7xyz = 10xyz$

5. Find the sum of the following expressions:

(i) $7p + 6q$

$$5p - q$$

$$16p + q$$

$$28p + q$$

(ii) $a + 5b + 7c$

$$2a + 10b + 9c$$

$$3a + 10b + 9c$$

(iii) $mn + t$

$$2mn - 2t$$

$$3mn - 3t$$

$$6mn - 4t$$

(iv) $u + v$

$$u - v$$

$$2u + 5v$$

$$2u - 5v$$

$$6u$$

(v) $5xyz - 3xy$

$$3zxy - 5yx$$

$$8xyz - 8yx$$

6. Subtract:

(i) $13x + 12y - 5$ from $27x + 5y - 43 = 27x + 5y - 43 - 13x - 12y + 5 = 14x - 7y - 38$

(ii) $a + 5b + 7c$ from $2a + 10b + 9c = 2a + 10b + 9c - a - 5b - 7c = a + 5b + 2c$

(iii) $m + n$ from $3m - 7n = 3m - 7n - m - n = 2m - 8n$

(iv) $2y + z$ from $6z - 5y = 6z - 5y - 2y - z = 5z - 7y$

7. Simplify:

(i) $(x + y - z) + (3x - 5y + 7z) - (14x + 7y - 6z)$

$$= -10x - 11y$$

(ii) $p + p + 2 + p + 3 - p - 4 - p - 5 + p + 10$

$$= 2p + 6$$

(iii) $n + (m + 1) + (n + 2) + (m + 3) + (n + 4) + (m + 5)$

$$3n + 3m + 6 + 9 = 3m + 3n + 15$$

Objective type questions

8. The addition of $3mn$, $-5mn$, $8mn$ and $-4mn$ is $2mn$
9. When we subtract 'a' from '- a', we get $-2a$
10. In an expression, we can add or subtract only like terms.

Simple linear equations

Exercise 3.3

1. Fill in the blanks:

- (i) An expression equated to another expression is called equation.
- (ii) If $a = 5$, the value of $2a + 5$ is 15.
- (iii) The sum of twice and four times of the variable x is $6x$.

2. Say True or False:

- (i) Every algebraic expression is an equation. False
- (ii) The expression $7x + 1$ can not be reduced without knowing the value of x . True
- (iii) To add two like terms, its coefficients can be added. True

3. Solve:

(i) $x + 5 = 8$

$$x = 8 - 5 = 3$$

(ii) $p - 3 = 7$

$$p = 10$$

(iii) $2x = 30$

$$x = 15$$

(iv) $m = 30$

(v) $7x + 10 = 80m$

$$7x = 70m - 10$$

4. What should be added to $3x + 6y$ to get $5x + 8y$?

$$3x + 6y + x = 5x + 8y$$

$$x = 5x + 8y - 3x - 6y = 2x + 2y$$

5. Nine added to thrice a whole number gives 45. Find the number.

$$3x + 9 = 45$$

$$3x = 45 - 9 = 36$$

$$x = 36/3 = 12$$

6. Find two consecutive odd numbers whose sum is 200.

$$3 + x + x + 1 = 206$$

$$2x + 4 = 200$$

$$2x = 196$$

$$x = 98$$

7. The taxi charges in a city comprise of a fixed charge of ` 100 for 5 kms and ` 16 per km for every additional km. If the amount paid at the end of the trip was Rs. 740 find the distance travelled.

Fixed charge = Rs. 100 for 5 km

Rs. 16 per km for every additional km

At the end of the trip, Rs. 740 was given

$$5 \text{ km} + x = 740$$

$$100 + x = 740$$

$$x = 740 - 100 = 640$$

Charge = Rs. 640

$$n \times 16 = 640$$

$$n = 640/16 = 40 \text{ km}$$

Objective type questions

8. The generalization of the number pattern 3, 6, 9, 12,... is $3n$

9. The solution of $3x + 5 = x + 9$ is 2

10. The equation $y + 1 = 0$ is true only when y is -1

Exercise 3.4

1. Subtract $-3ab - 8$ from $3ab + 8$. Also, subtract $3ab + 8$ from $-3ab - 8$.

(i) $3ab + 8 + 3ab + 8 = 6ab + 16$

(ii) $-3ab - 8 - 3ab - 8 = -6ab - 16$

2. Find the perimeter of a triangle whose sides are $x + 3y$, $2x + y$, $x - y$.

$$\text{Perimeter} = a + b + c = 4x + 3y$$

3. Thrice a number when increased by 5 gives 44. Find the number.

$$3x + 5 = 44$$

$$3x = 44 - 5 = 39$$

$$x = 13$$

4. How much smaller is $2ab + 4b - c$ than $5ab - 3b + 2c$

$$5ab - 3b + c - 2ab - 4b + c = 3ab - 7b + 2c$$

5. Six times a number subtracted from 40 gives -8 . Find the number.

$$40 - 6x = -8$$

$$48 = 6x$$

$$x = 48/6 = 8$$

CHAPTER – 4 DIRECT AND INVERSE PROPORTIONS

Exercise 4.1

1. Fill in the blanks:

(i) If the cost of 8 apples is Rs. 56 then the cost of 12 apples is Rs. 84.

(ii) If the weight of one fruit box is $3\frac{1}{2}$ kg, then the weight of 6 such boxes is 21 kg.

(iii) A car travels 60 km with 3 litres of petrol. If the car has to cover the distance of 200 km, it requires 10 litres of petrol.

(iv) If 7 m cloth costs Rs. 294, then the cost of 5 m of cloth is Rs. 210.

(v) If a machine in a cool drinks factory fills 600 bottles in 5 hrs, then it will fill 360 bottles in 3 hours.

2. Say True or False:

(i) Distance travelled by a bus and time taken are in direct proportion. True

(ii) Expenditure of a family to number of members of the family is in direct proportion. True

(iii) Number of students in a hostel and consumption of food are not in direct proportion. False

(iv) If Mallika walks 1 km in 20 minutes, then she can cover 3 km in 1 hour. True

(v) If 12 men can dig a pond in 8 days, then 18 men can dig it in 6 days. False

3. A dozen bananas costs Rs. 20. What is the price of 48 bananas?

Number of bananas	12	48
-------------------	----	----

Cost	Rs. 20	x
------	--------	---

$$\frac{12}{20} = \frac{48}{x} = x = 80$$

Cost of bananas = Rs. 80

4. A group of 21 students paid Rs. 840 as the entry fee for a magic show. How many students entered the magic show if the total amount paid was Rs.1,680?

Students	21	x
----------	----	---

Cost	840	1680
------	-----	------

$$\frac{21}{840} = \frac{x}{1680}$$

$$x = \frac{21 \times 168}{84} = 42 \text{ students}$$

5. A birthday party is arranged in third floor of a hotel. 120 people take 8 trips in a lift to go to the party hall. If 12 trips were made how many people would have attended the party?

People	120	x
--------	-----	---

Trips	8	12
-------	---	----

$$\frac{120}{8} = \frac{x}{12}$$

x = 180 people for 12 trips

6. The shadow of a pole with the height of 8 m is 6m. If the shadow of another pole measured at the same time is 30m, find the height of the pole?

Pole (m)	8	x
----------	---	---

Shadow (m)	6	30 m
------------	---	------

$$\text{Height of the pole} = \frac{8}{6} = \frac{x}{30}$$

x = 40 length of the pole

7. A postman can sort out 738 letters in 6 hours. How many letters can be sorted in 9 hours?

Sorted letters	738	x
----------------	-----	---

Hours 6 9

$$\frac{738}{6} = \frac{x}{9} = x = 123 \times 9 = 1107$$

In 9 hours he sorted letters 1107

8. If half a meter of cloth costs Rs. 15. Find the cost of meters of the same cloth.

Cloth $\frac{1}{2}$ $8\frac{1}{3}$

Cost Rs. 15 x

$$\frac{\frac{1}{2}}{15} = \frac{8\frac{1}{3}}{x}$$

$$\frac{1}{30} = \frac{25}{3x} = x = \text{Rs. } 250$$

9. The weight of 72 books is 9kg. What is the weight of 40 such books? (using unitary method)

The weight of 72 books = 9 kg

Weight of 1 book = $\frac{9}{72}$ kg

Weight of 40 books = $\frac{9}{72} \times 40 = 5$ kg

10. Thamarai pays ` 7500 as rent for 3 months. With the same rate how much does she have to pay for 1 year? (using unitary method).

For 3 month thamarai rent = Rs. 7500

1 month = $\frac{7500}{3} = 2500$

one year = 12 month rent = $2500 \times 12 = 30000$

For one year she have to pay = Rs. 30000

11. If 30 men can reap a field in 15 days, then in how many days can 20 men reap the same field? (using unitary method)

30 men can reap a field in 15 days

1 men can reap = $\frac{15}{30} = \frac{1}{2}$ days

20 men can reap = $\frac{1}{2} \times 20 = 10$ days

12. Valli purchases 10 pens for ₹ 180 and Kamala buys 8 pens for ₹ 96. Can you say who bought the pen cheaper? (using unitary method)

10 pens cost = 180

1 pen cost = $180/10 = \text{Rs. } 18$

8 pen cost = Rs. 96

1 pen cost = $96/8 = \text{Rs. } 12$

Kamala buys the pens cheaper

13. A motorbike requires 2 litres of petrol to cover 100 kilometers. How many litres of petrol will be required to cover 250 kilometers? (Using unitary method)

2 litres of petrol covers = 100 kilometre

1 kilometre required

$\frac{2}{100}$ lt petrol

250 kilometre required $\frac{2}{100} \times 250 = 5$ litres

Objective type questions

14. If the cost of 3 books is Rs.90, then find the cost of 12 books Rs. 360

15. If Mani buys 5kg of potatoes for Rs. 75 then he can buy 7 kg of potatoes for ₹ 105.

16. 35 cycles were produced in 5 days by a company then 147 cycles will be produced in 21 days.

17. An aircraft can accommodate 280 people in 2 trips. It can take 10 trips to take 1400 people.

18. Suppose 3 kg. of sugar is used to prepare sweets for 50 members, then 9 kg. of sugar is required for 150 members.

Inverse Proportion

Exercise 4.2

1. Fill in the blanks:

(i) 16 taps can fill a petrol tank in 18 minutes. The time taken for 9 taps to fill the same tank will be 32 minutes.

(ii) If 40 workers can do a project work in 8 days, then 80 workers can do it in 4 days.

2. 6 pumps are required to fill a water sump in 1 hr 30 minutes. What will be the time taken to fill the sump if one pump is switched off?

6 pumps are required to fill the water sump = 90 minutes

The time taken to fill the sump if one pump is switched off

Pumps 6 5

Time (min) 90 x

$$6 \times 90 = x \times 5$$

$$\frac{6 \times 90}{5} = x = 108 \text{ minutes}$$

3. A farmer has enough food for 144 ducks for 28 days. If he sells 32 ducks, how long will the food last?

(x) ducks 144 122 inverse proportion

(y) days 28 x

$$144 \times 28 = x \times 112$$

$$\frac{144 \times 28}{112} = x = 36 \text{ days}$$

4. It takes 60 days for 10 machines to dig a hole. Assuming that all machines work at the same speed, how long will it take 30 machines to dig the same hole?

Days (x) 60 x

Machines (y) 10 30

$$x_1 y_1 = x_2 y_2$$

$$60 \times 10 = x \times 30$$

$$x = \frac{60 \times 10}{30} = 20 \text{ days}$$

5. Forty students stay in a hostel. They had food stock for 30 days. If the students are doubled then for how many days the stock will last?

Students (x) Days (y)

x = 40 30

2x = 80 a indirect proportion

$$x_1y_1 = x_2y_2 = \text{constant}$$

$$40 \times 30 = 80 \times a$$

$$\frac{40 \times 30}{280} = a = 15 \text{ days}$$

If the students doubled then for 15 days the stock will last

6. Meena had enough money to send 8 parcels each weighing 500 grams through a courier service. What would be the weight of each parcel, if she has to send 40 parcels for the same money?

x	parcels	8	40	
y	weight(gm)	500	x	inverse proportion

$$x_1y_1 = x_2y_2 = \text{constant}$$

$$8 \times 500 = X \times 40$$

$$\frac{8 \times 500}{40} = x = 100 \text{ gram parcels}$$

7. It takes 120 minutes to weed a garden with 6 gardeners. If the same work is to be done in 30 minutes, how many more gardeners are needed?

x	time(min)	120	30	
y	gardeners	6	x	inverse proportion

$$x_1y_1 = x_2y_2 = \text{constant}$$

$$120 \times 6 = 30 \times X$$

$$\frac{120 \times 6}{30} = 24 \text{ gardeners}$$

8. Neelaveni goes by bi-cycle to her school every day. Her average speed is 12km/hr and she reaches school in 20 minutes. What is the increase in speed, if she reaches the school in 15 minutes?

Speed km/hr	12	x
-------------	----	---

Time (min)	20	15
------------	----	----

$$x_1y_1 = x_2y_2 = \text{constant}$$

$$12 \times 20 = 15 \times X$$

$$\frac{12 \times 20}{15} = x = \frac{48}{3} = 16 \text{ km/ hr}$$

9. A toy company requires 36 machines to produce car toys in 54 days. How many machines would be required to produce the same number of car toys in 81 days?

x	machines	36	x
y	days	54	81

$$x_1y_1 = x_2y_2 = \text{constant}$$

$$56 \times 36 = X \times 81$$

$$\frac{54 \times 36}{81} = x = 24 \text{ machines required}$$

Objective type questions

10. 12 cows can graze a field for 10 days. 20 cows can graze the same field for 6 days.

11. 4 typists are employed to complete a work in 12 days. If two more typists are added, they will finish the same work in 8 days.

Miscellaneous Practice problems

Exercise 4.3

1. If the cost of 7kg of onions is Rs. 84 find the following

(i) Weight of the onions bought for Rs. 180

kg (onion)	7	x	
cost (Rs.)	84	180	direct proportion

$$\frac{7}{84} = \frac{x}{180}$$

$$\frac{7 \times 180}{84} = x = 15 \text{ kg onions}$$

(ii) The cost of 3 kg of onions

kg (onion)	7	3	
cost (Rs.)	84	x	direct proportion

$$\frac{7}{84} = \frac{3}{x}$$

$$\frac{3 \times 84}{7} = x = \text{Rs. } 36$$

2. If $C = kd$,

(i) what is the relation between C and d?

Direct proportion

(ii) find k when $C = 30$ and $d = 6$

$$c = kd \Rightarrow 30 = k(6)$$

$$k = \frac{30}{6} = 5$$

(iii) find C, when $d = 10$

$$k = 5, d = 10$$

$$c = 5 \times 10 = 50$$

3. Every 3 months Tamilselvan deposits Rs. 5000 as savings in his bank account. In how many years he can save Rs. 1,50,000.

For every 3 month he deposits 5000 for 1 year Rs. 20000

year	1	x	
Amount	20000	150000	direct proportion

$$\frac{1}{20000} = \frac{x}{150000}$$

$$x = \frac{150000}{20000} = 7\frac{1}{2} \text{ years}$$

4. A printer, prints a book of 300 pages at the rate of 30 pages per minute. Then, how long will it take to print the same book if the speed of the printer is 25 pages per minute?

Total pages = 300

30 pages per minute

$$1 \text{ page} = \frac{1}{30} \text{ min}$$

$$300 \text{ pages} = \frac{1}{30} \times 300 \text{ min} = 10 \text{ min}$$

$$1 \text{ page} = \frac{1}{25} \text{ min}$$

$$300 \text{ pages} = \frac{1}{25} \times 300 \text{ min} = 12 \text{ min}$$

5. If the cost of 6 cans of juice is ` 210, then what will be the cost of 4 cans of juice?

$$6 \text{ cans of juice} = \text{Rs. } 210$$

$$1 \text{ can of juice} = \frac{210}{6}$$

$$4 \text{ can of juice} = \frac{210}{6} \times 4 = \text{Rs. } 140$$

6. x varies inversely as twice of y . Given that when $y = 6$, the value of x is 4. Find the value of x when $y = 8$.

$$x \propto \frac{1}{2y}, y = 6, x = 4$$

$$x \propto \frac{1}{2y} \quad x = k \frac{1}{2y}$$

$$4 = k \frac{1}{2 \times 6} = k = 48$$

$$x = 48 \times \frac{1}{2 \times 8} = 3$$

7. A truck requires 108 litres of diesel for covering a distance of 594km. How much diesel will be required to cover a distance of 1650km?

$$x_1 \quad \text{litres} \quad 108 \quad x$$

$$y_1 \quad \text{km} \quad 594 \quad 1650$$

$$\frac{108}{594} = \frac{x}{1650}$$

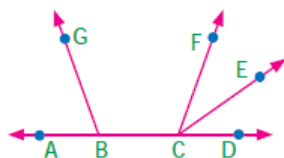
$$x = 1650 \times \frac{108}{594} = 300 \text{ litres of diesel will be required.}$$

CHAPTER – 5

GEOMETRY

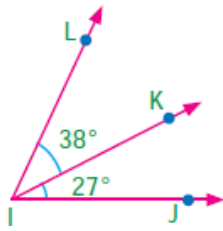
Exercise 5.1

1. Name the pairs of adjacent angles.



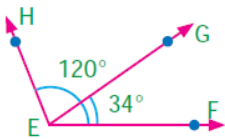
$\angle ABG, \angle GBC, \angle FCE, \angle ECD$

2. Find the angle $\angle JIL$ from the given figure



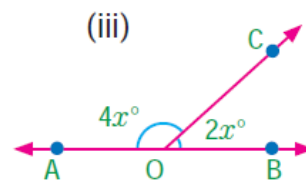
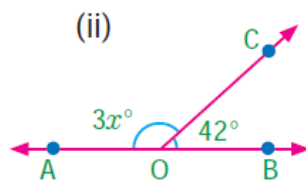
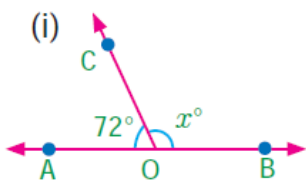
$$\angle JIL = \angle LIK + \angle KIJ = 38^\circ + 27^\circ = 65^\circ$$

3. Find the angle $\angle GEH$ from the given figure



$$\angle GEH = 120^\circ$$

4. Given that AB is a straight line. Calculate the value of x° in the following case



Straight line angle = 180°

(i) $\angle AOC + \angle COB = 180^\circ$

$$72^\circ + x^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 72^\circ = 108^\circ$$

(ii) $\angle AOC + \angle COB = 180^\circ$

$$3x^\circ + 42^\circ = 180^\circ$$

$$3x^\circ = 180^\circ - 42^\circ = 138^\circ$$

$$x^\circ = 138/3 = 46^\circ$$

(iii) $\angle AOC + \angle COB = 180^\circ$

$$4x^\circ + 2x^\circ = 180^\circ$$

$$6x^\circ = 180^\circ$$

$$x^\circ = 180/6 = 30^\circ$$

5. One angle of a linear pair is right angle what can you say about the other angle?

The other angle is also a right angle

6. If the three angles at a point are in the ratio 1 : 4 : 7, find the value of each angle?

$$x + 4x + 7x = 360^\circ$$

$$12x^\circ = 360^\circ$$

$$x^\circ = \frac{360^\circ}{12} = 30^\circ$$

$$x^\circ = 30^\circ, 4x = 120^\circ, 7x = 210^\circ$$

7. There are six angles at a point. One of them is 45° and the other five angles are all equal. What is the measure of all the five angles?

$$45^\circ + 5x = 360^\circ$$

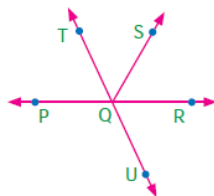
$$5x = 360^\circ - 45^\circ$$

$$x = 315^\circ/5 = 63^\circ$$

8. In the given figure, identify

(i) any two pairs of adjacent angles.

(ii) two pairs of vertically opposite angles.



(i) $\angle TQS, \angle SQR$

$\angle SQR, \angle RQU$

(ii) $\angle TQR, \angle PQU$

$\angle TQP, \angle RQU$

9. The angles at a point are $x^\circ, 2x^\circ, 3x^\circ, 4x^\circ$ and $5x^\circ$. Find the value of the largest angle?

Angle at a point = 360°

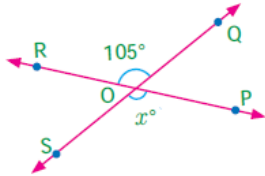
$$x^\circ + 2x^\circ + 3x^\circ + 4x^\circ + 5x^\circ = 360^\circ$$

$$15x^\circ = 360^\circ$$

$$x^\circ = 360/15 = 24^\circ$$

$$\text{The value of largest angle} = 5 \times 24^\circ = 120^\circ$$

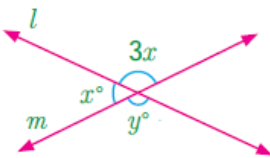
10. From the given figures, find the missing angle.



$$x^\circ = 105^\circ \text{ (vertically opposite angles)}$$

$$\angle QOP = 75^\circ = \angle POS$$

11. Find the angles x° and y°



$$3x + x = 180^\circ$$

$$4x = 180^\circ$$

$$x^\circ = 180/4 = 45^\circ$$

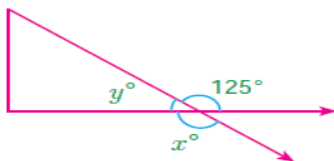
$$x^\circ + y^\circ = 180^\circ$$

$$y^\circ = 180^\circ - 45^\circ = 135^\circ$$

12. Using the figures, answer the following question

(i) What in the measure of angle x° ?

(ii) What in the measure of angle y° ?



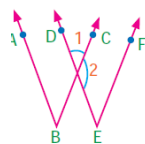
$$y + 125^\circ = 180^\circ \Rightarrow y = 180^\circ - 125^\circ \Rightarrow y = 55^\circ$$

$$x^\circ = 125^\circ \text{ (vertically opposite angles)}$$

Objective type questions

13. Adjacent angles have one common arm, one common vertex, no common interior

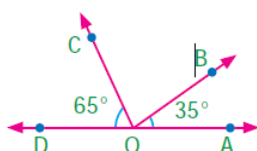
14. In the given figure the angles $\angle 1$ and $\angle 2$ are Adjacent angles



15. Vertically opposite angles are equal in measure

16. The sum of all angles at a point is 360°

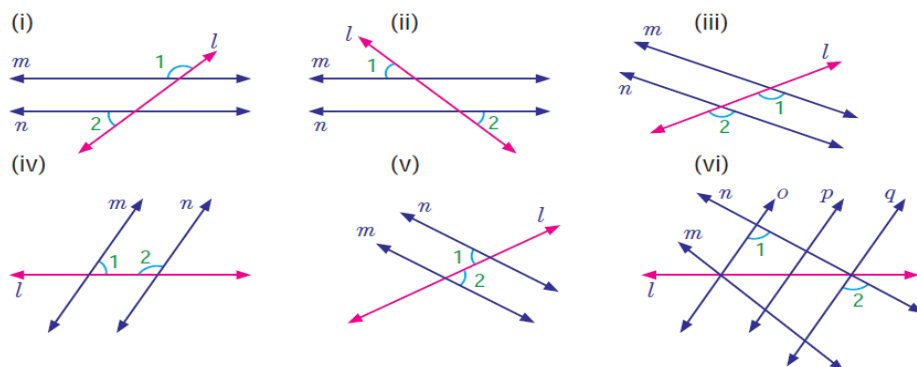
17. The measure of $\angle BOC$ is 80°



Transversal

Exercise 5.2

1. From the figures name the marked pair of angle:



(i) The angles are exterior angles on the same side of the transversal

(ii) The angles are alternate exterior angles

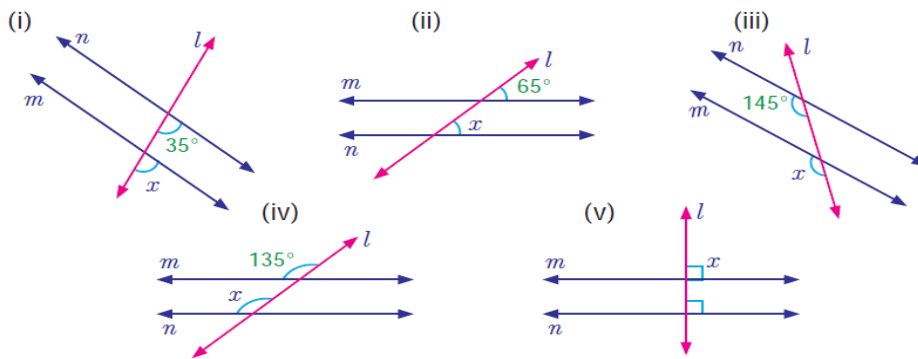
(iii) The angles are corresponding angles

(iv) The angles are interior angles on the same side of the transversal

(v) The angles are alternate interior angles

(vi) The angles are corresponding angles

2. Find the measure of angle x in each of the following cases



(i) $x = 35^\circ$ corresponding angles

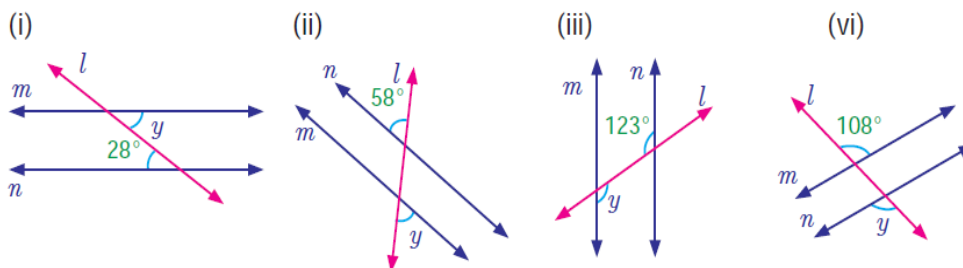
(ii) $x = 65^\circ$ corresponding angles

(iii) $x = 145^\circ$ corresponding angles

(iv) $x = 135^\circ$ corresponding angles

(v) $x = 90^\circ$ corresponding angles

3. Find the measure of angle y in each of the following figures



(i) $y = 28^\circ$ (alternate interior angles)

(ii) $y = 58^\circ$ (alternate exterior angles)

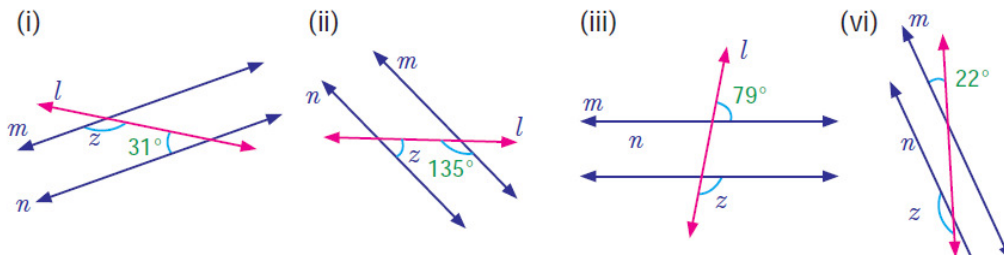
(iii) $123 + y = 180^\circ$

$$y = 180^\circ - 123^\circ$$

$y = 57^\circ$ (alternate interior angles)

(iv) $y = 108^\circ$ (alternate exterior angles)

4. Find the measure of angle z in each of the following figures



(i) Co-interior angles sum = 180°

$$z + 31^\circ = 180^\circ$$

$$z = 180^\circ - 31^\circ = 149^\circ$$

(ii) Co-interior angles sum = 180°

$$z + 135^\circ = 180^\circ$$

$$z = 180^\circ - 135^\circ = 45^\circ$$

(iii) Co-exterior angle sum = 180°

$$z + 79^\circ = 180^\circ$$

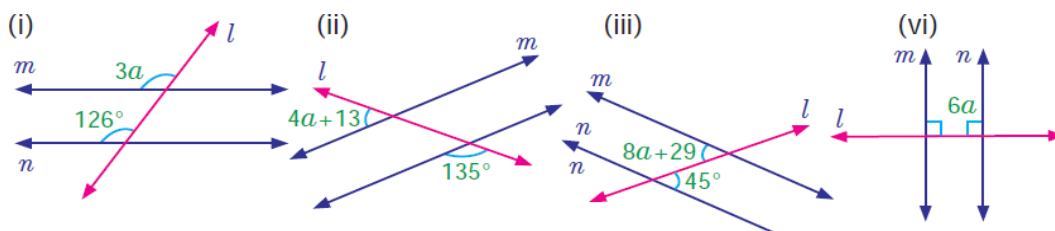
$$z = 180^\circ - 79^\circ = 101^\circ$$

(iv) Co-exterior angle sum = 180°

$$z + 22^\circ = 180^\circ$$

$$z = 180^\circ - 22^\circ = 158^\circ$$

5. Find the value of angle a in each of the following figures



(i) $3a = 126^\circ$

$$a = 126^\circ / 3 = 42^\circ$$

(ii) $4a + 13 + 135^\circ = 180^\circ$

co-exterior angle sum = 180°

$$4a + 148^\circ = 180^\circ$$

$$4a = 180^\circ - 148^\circ$$

$$4a = 32^\circ$$

$$a = \frac{32^\circ}{4} = 8^\circ$$

$$(iii) 8a + 29 = 45^\circ$$

Interior angles are equal

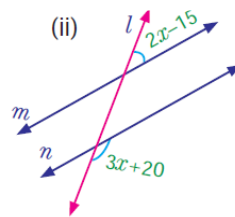
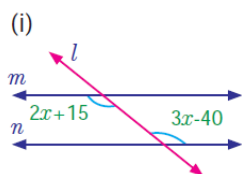
$$8a = 45 - 29 = 16$$

$$8a = 16$$

$$a = \frac{16}{8} = 2$$

$$(iv) 6a = 90^\circ \Rightarrow a = 90/6 = 15^\circ$$

6. Find the value of angle x in both the figures



$$(i) 2x + 15 = 3x - 40$$

co-interior angles are equal

$$x = 55^\circ$$

$$(ii) \text{Co-exterior angle sum} = 180^\circ$$

$$2x - 15 + 3x + 20 = 180^\circ$$

$$5x + 5 = 180^\circ$$

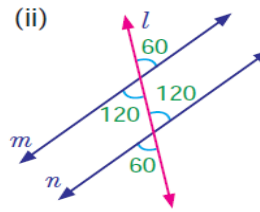
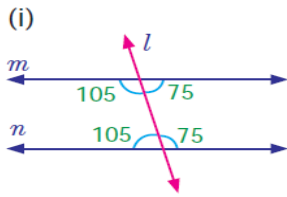
$$5x = 180^\circ - 5$$

$$5x = 175^\circ$$

$$x = 175^\circ / 5$$

$$x = 35^\circ$$

7. Anbu has marked the angles as shown below in (i) and (ii) Check whether both of them are correct. Give reasons



(i) Straight line angle = 180° = correct

(ii) Vertically opposite angles are equal = incorrect

8. Mention two real-life situations where we use parallel lines.

1. Railway track
2. Scale

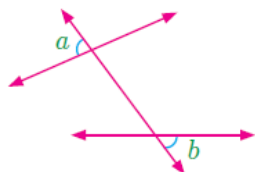
9. Two parallel lines are intersected by a transversal. What is the minimum number of angles you need to know to find the remaining angles. Give reasons.

Minimum number of angles is 1. Using the concept of linear pair of angles, we can find one more angles and by concepts of corresponding angles and alternate angles we could find all other angles.

Objective type questions

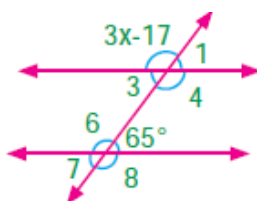
10. A line which intersects two or more lines in different points is known as Transversal

11. In the given figure, angles a and b are alternate exterior angles



12. Which of the following statements is ALWAYS TRUE when parallel lines are cut by a transversal interior angles on the same side of the transversal are supplementary

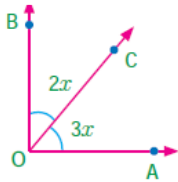
13. In the diagram, what is the value of angle x ? 44°



Miscellaneous Practice problems

Exercise 5.6

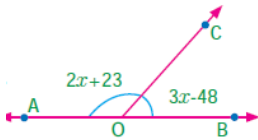
1. Find the value of x if $\angle AOB$ is a right angle:



$$\angle BOC + \angle COA = 5x = 90$$

$$x = 90/5 = 18$$

2. In the given figures, find the value of x



$$2x + 23 + 3x - 48 = 180$$

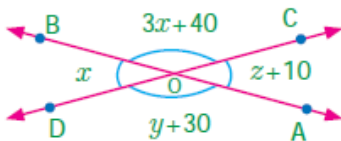
$$5x - 25 = 180$$

$$5x = 180 + 25$$

$$5x = 205$$

$$x = 41^\circ$$

3. Find the value of x , y and z



$$x = z + 10$$

$$x - z - 10 = 0$$

$$3x + 40 = y + 30$$

$$3x - y + 40 - 30 = 0$$

$$3x - y + 10 = 0$$

$$3z - y + 40 = 0$$

$$-3x + 3z + 30 = 0$$

$$3z - y + 40 = 0$$

$$3x + 40 + z + 10 + x + y + 30 = 360$$

$$4x + z + 80 + y = 360$$

$$4x + z + y + 80 = 360$$

$$4(z + 10) + z + y + 80 = 360$$

$$4z + z + y + 120 = 360$$

$$5z + y - 240 = 0$$

$$3z - y + 40 = 0$$

$$8z - 200 = 0$$

$$z = 25^\circ$$

$$3(25) - y + 40 = 0$$

$$75 + 40 = y$$

$$y = 115^\circ$$

$$x = z + 10 = 25 + 10 = 35^\circ$$

$$x = 35^\circ, y = 115^\circ, z = 25^\circ$$

4. Two angles are in the ratio 11:25. If they are linear pair, find the angles.

$$11x + 25x = 360/2 = 180^\circ$$

$$36x = 360/2 = 180^\circ$$

$$x = \frac{360^\circ}{36 \times 2} = 5^\circ$$

$$11x = 11 \times 5 = 55^\circ$$

$$25x = 25 \times 5 = 125^\circ$$

5. Using the figure, answer the following questions and justify your answer.

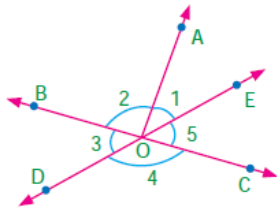
(i) Is $\angle 1$ adjacent to $\angle 2$?

(ii) Is $\angle AOB$ adjacent to $\angle BOE$?

(iii) Does $\angle BOC$ and $\angle BOD$ form a linear pair?

(iv) Are the angles $\angle COD$ and $\angle BOD$ supplementary?

(v) Is $\angle 3$ vertically opposite to $\angle 1$?



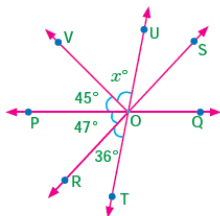
(i) Yes. They have a common vertex; a common arm and their interior do not overlap.

(ii) No. They have overlapping interiors.

(iii) No. Since $\angle BOC$ is a straight angle, their sum will exceed 180°

(iv) Yes. They are not formed by intersecting lines.

6. In the figures POQ, ROS and TOU are straight lines. Find x°



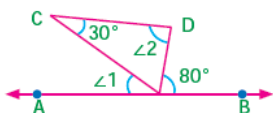
TOU is a straight line

$$36^\circ + 47^\circ + 45^\circ + x^\circ = 180^\circ$$

$$128^\circ + x^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 128^\circ = 52^\circ$$

7. In the figure AB is parallel to DC. Find the value of $\angle 1$ and $\angle 2$. Justify your answer.



$$80^\circ + 100^\circ = 180^\circ$$

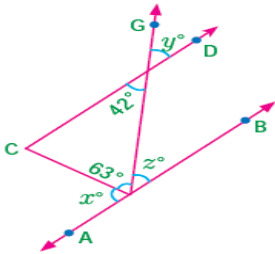
$$\angle 1 = 30^\circ$$

$$100^\circ - 30^\circ = 70^\circ$$

$$\angle 2 + 30^\circ + 70^\circ = 180^\circ$$

$$\angle 2 = 180^\circ - 100^\circ = 80^\circ$$

8. In the figures AB is parallel to CD. Find x, y and z.



$$y^\circ = 42^\circ \text{ (vertically opposite angles are equal)}$$

$$x + 63^\circ + z^\circ = 180^\circ$$

$$42^\circ + 63^\circ + z^\circ = 180^\circ$$

$$105^\circ + z^\circ = 180^\circ$$

$$z^\circ = 180^\circ - 105^\circ = 75^\circ$$

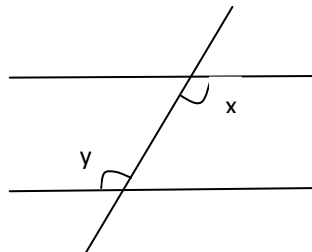
9. Draw two parallel lines and a transversal. Mark two alternate interior angles G and H. If they are supplementary what is the measure of each angle?

$$x = y$$

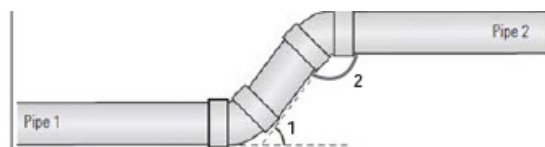
$$x + y = 180^\circ$$

$$x + x = 180^\circ$$

$$x = 90^\circ$$



10. A plumber must install pipe 2 parallel to pipe 1. He knows that $\angle 1$ is 53. What is the measure of $\angle 2$



$$\text{Co-exterior angle sum} = 180^\circ$$

$$53 + x = 180^\circ$$

$$x = 180^\circ - 53$$

$$x = 127^\circ$$

CHAPTER – 6

INFORMATION PROCESSING

Tetromino

Join two squares of size 1cm x 1cm edge to edge. Such formation is called as **Domino**.

When we arrange Domino either horizontally or vertically.
















When we join three squares along their edges we get the formation called **Trinomino**.

Exercise 6.1

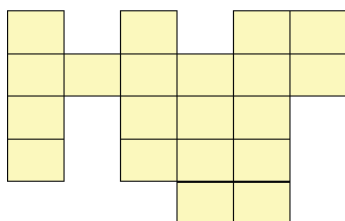
1. A tetromino is a shape obtained by 4 squares together.

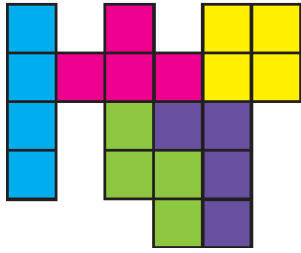
2. Draw a tetromino which passes symmetry 

3. Complete the table:

S.No.	Tetro Minoes	Rotation of Tetrominoes°			
		90°	180°	270°	360°
1					
2					
3					

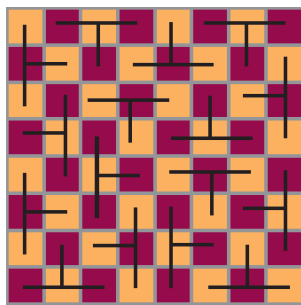
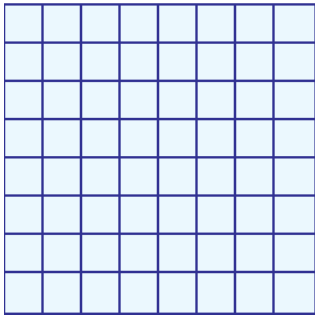
4. Shade the figures completely, by using five Tetromino shapes only once













Ans:

5. Using the given tetromino shaded in two different ways ()

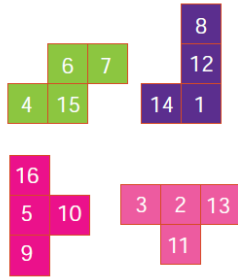
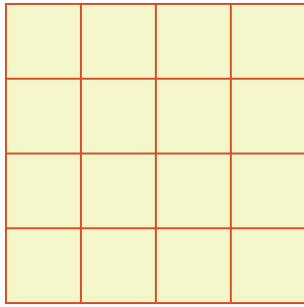


Ans:

6. Match the tetrominoes of same type

- (i)  
- (ii)  
- (iii)  
- (iv)  

7. Using the given tetrominoes with numbers, complete the 4 x 4 magic square



16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Ans:

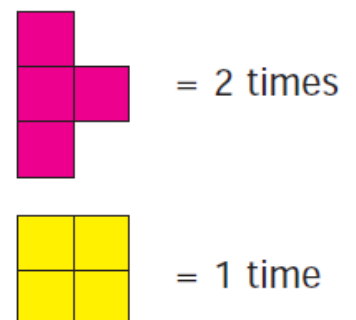
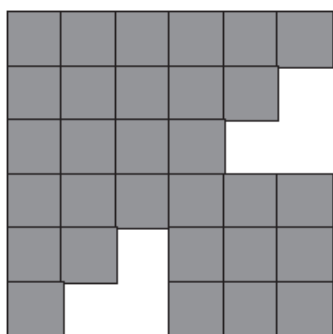
ROUTE MAP

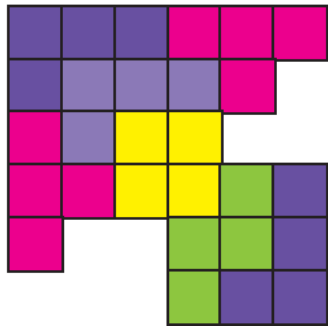
Maps are used to display a wide variety of information. Reading a map can help us to solve many problems in travel such as planning, for travel, place of visit. Let us, learn how to find the shortest possible route in a map.

Miscellaneous Practice problems

Exercise 6.2

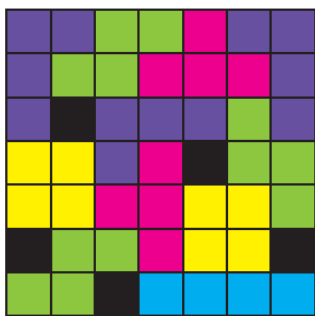
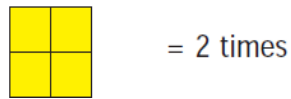
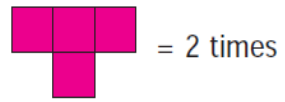
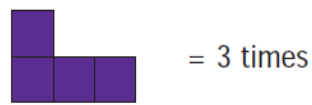
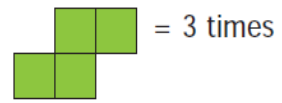
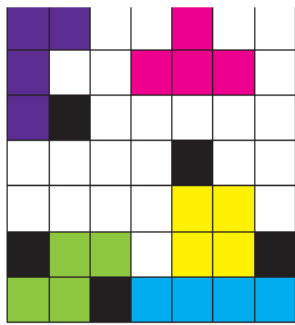
1. Make a model of fish using the given tetromino shapes





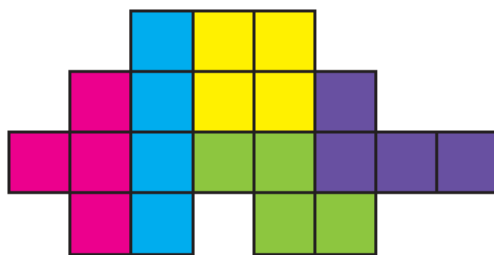
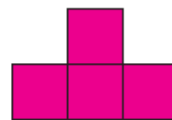
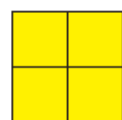
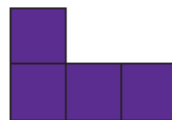
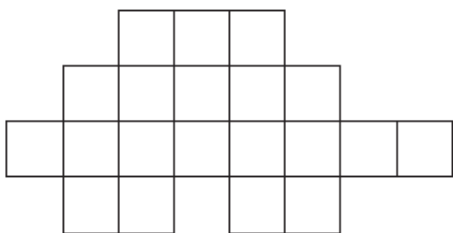
Ans:

2. Complete the given rectangle using the given tetromino shapes.



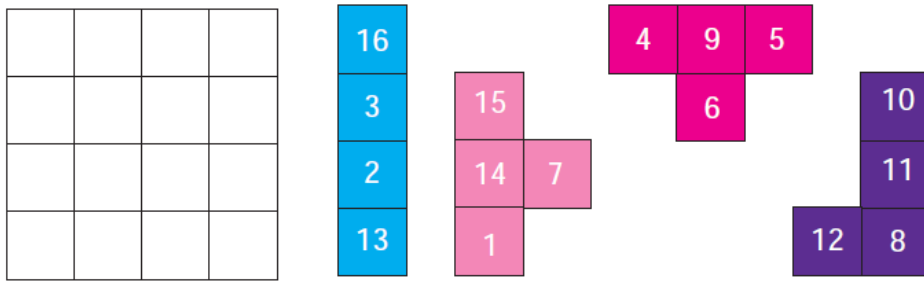
Ans:

3. Shade the figure completely by using five tetromino shapes only once



Ans:

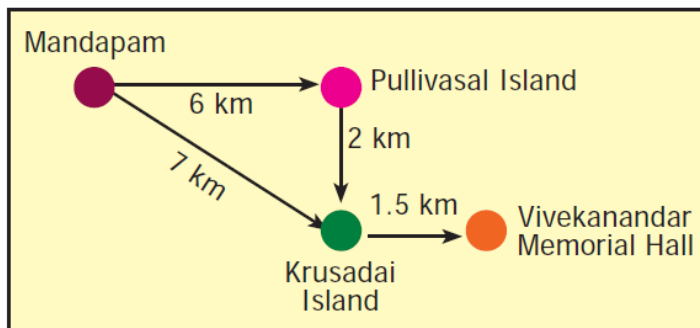
4. Using the given tetrominoes with numbers on it, complete the 4 x 4 magic square?



16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Ans:

5. Find the shortest route to Vivekanandar Memorial Hall from the Mandapam using the given map



Ans: Mandapam → Krusadai Island → Vivekanandar Memorial Hall