

International Indian School, Riyadh

Worksheet - VIII

Mathematics, SA - 2, 2016-2017

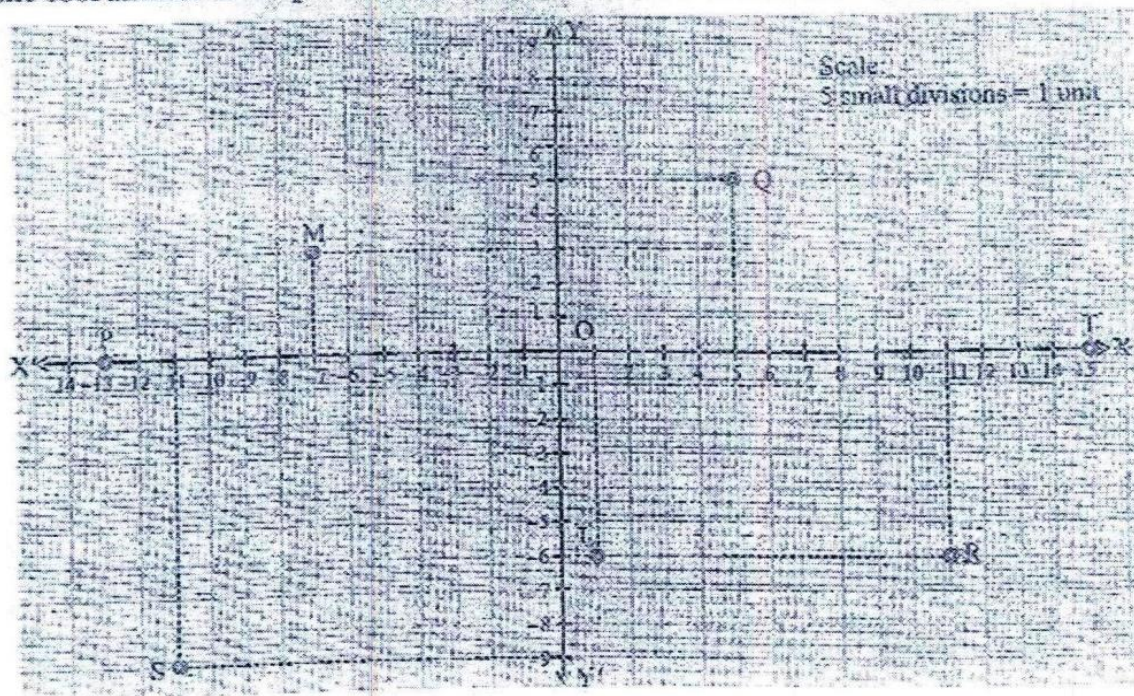
1. Construct a quadrilateral ABCD in which $AB = 4.5$ cm, $BC = 6$ cm, $CD = 5.6$ cm, $DA = 7.8$ cm and diagonal $AC = 9$ cm.
2. Construct a quadrilateral ABCD in which $AB = 4$ cm, $BC = 6$ cm, $CD = 5$ cm, $DA = 3.5$ cm and diagonal $AC = 7$ cm.
3. Construct a quadrilateral ABCD in which $AB = 8$ cm, $BC = 9$ cm, $CD = 5$ cm, $DA = 6.7$ cm and diagonal $BD = 7$ cm.
4. Construct a quadrilateral PQRS in which $PQ = 5$ cm, $QR = 5.5$ cm, $RS = 6$ cm, $SP = 8.9$ cm and $\angle P = 60^\circ$.
5. Construct a quadrilateral ABCD in which $AB = 7$ cm, $BC = 4.1$ cm, $AD = 6.3$ cm, diagonal $BD = 8.7$ cm and diagonal $AC = 8.9$ cm.
6. Construct a quadrilateral ABCD in which $AB = 6.5$ cm, $BC = 5.5$ cm, $DA = 3.8$ cm, $\angle A = 90^\circ$ and $\angle B = 70^\circ$.
7. Construct a quadrilateral ABCD with $BC = 5.5$ cm, $CD = 4$ cm, $DA = 4$ cm, $\angle C = 90^\circ$ and $\angle D = 85^\circ$.
8. Construct a quadrilateral PQRS in which $PQ = 4.5$ cm, $QR = 7.5$ cm, $\angle P = 100^\circ$, $\angle Q = 85^\circ$ and $\angle R = 75^\circ$.
9. Construct a quadrilateral PQRS in which the sides are $PQ = 5$ cm, $QR = 8.3$ cm, $RS = 6.4$ cm, $SP = 9$ cm and $\angle S = 90^\circ$.
10. Construct a quadrilateral LMNO in which $LM = 5$ cm, $MN = 6.5$ cm, $\angle L = 75^\circ$, $\angle M = 105^\circ$ and $\angle N = 120^\circ$.
11. Construct a quadrilateral ABCD in which $AB = 4.1$ cm, $BC = 3.8$ cm, $\angle A = 60^\circ$, $\angle C = 82^\circ$ and $\angle B = 125^\circ$.
12. Construct a parallelogram, one of whose sides is 5.5 cm and whose diagonals are 5.8 cm and 7 cm.
13. Construct a parallelogram, one of whose sides is 6 cm and whose diagonals are 6 cm and 8 cm.
14. Construct a parallelogram ABCD in which $AB = 4.5$ cm, $BC = 4$ cm and diagonal $AC = 6.2$ cm.
15. Construct a parallelogram ABCD in which $AB = 6.5$ cm, $AD = 3$ cm and diagonal $BD = 4.9$ cm.
16. Construct a parallelogram OKAY in which $OK = 5$ cm, $KA = 6$ cm and $\angle Y = 50^\circ$.
17. Construct a rectangle ABCD whose sides are 6 cm and 3 cm.
18. Construct a parallelogram PQRS in which $QR = 4$ cm, $PQ = 5.5$ cm and $\angle Q = 78^\circ$.
19. Construct a parallelogram whose diagonals are 4.4 cm and 7.4 cm, and an angle between them is 75° .
20. Construct a rectangle ABCD whose one side is 4 cm and diagonal is 5 cm.
21. Construct a parallelogram ABCD in which $BC = 3.5$ cm, $\angle C = 80^\circ$ and $CD = 4$ cm.

22. Construct a rectangle ABCD whose one side is 3.5 cm and diagonal is 6 cm.
23. Construct a rectangle ABCD whose sides are 4 cm and 2 cm.
24. Construct a square, each of whose sides measures 4.4 cm.
25. Construct a square, each of whose diagonals measures 6.4 cm.
26. Construct a rhombus whose diagonals are 5 cm and 6 cm.
27. Construct a rhombus with side 6.4 cm and one of whose angles is equal to 70° .

Chap. 15. INTRODUCTION TO GRAPH

Exercise 15.1

1. Find the coordinates of the points P, Q, R, S, T, L and M from the following graph.



2. Plot the following points on graph and name the quadrant/axis.

(i) A(-3, 7)

(ii) B(-2, -5)

(iii) C(3, -4)

(iv) D(-9, 0)

(v) E(-7, -7)

(vi) F(6, -3)

(vii) G(0, -3)

(viii) H(4, 0)

(ix) I(-4, 3)

(x) J(6, 5)

3. Without plotting on the graph, name the quadrant/axis of the following coordinates.

(i) P(-3, -10)

(ii) Q(7, -5)

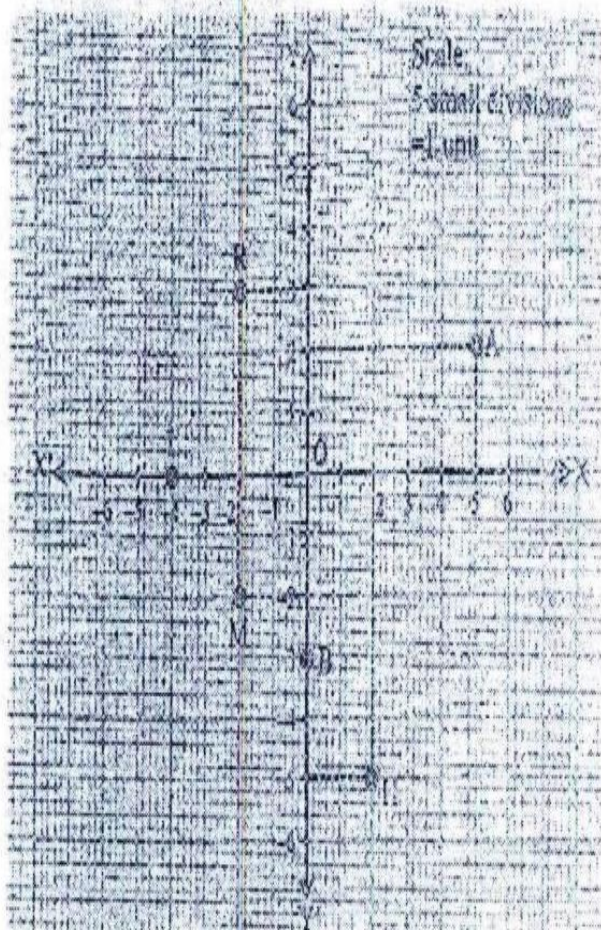
(iii) R(3, 0)

(iv) S(4, 2)

(v) T(-8, 4)

(vi) Z(0, -11)

Find the coordinates of the following points from the given graph. Also, name the quadrants in which they lie.



5. Using the following data of the temperature at 12 o'clock during a certain week. Plot the graph between temperature versus day.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temp. (in $^{\circ}\text{C}$)	35 $^{\circ}\text{C}$	34 $^{\circ}\text{C}$	37 $^{\circ}\text{C}$	39 $^{\circ}\text{C}$	42 $^{\circ}\text{C}$	36 $^{\circ}\text{C}$	40 $^{\circ}\text{C}$

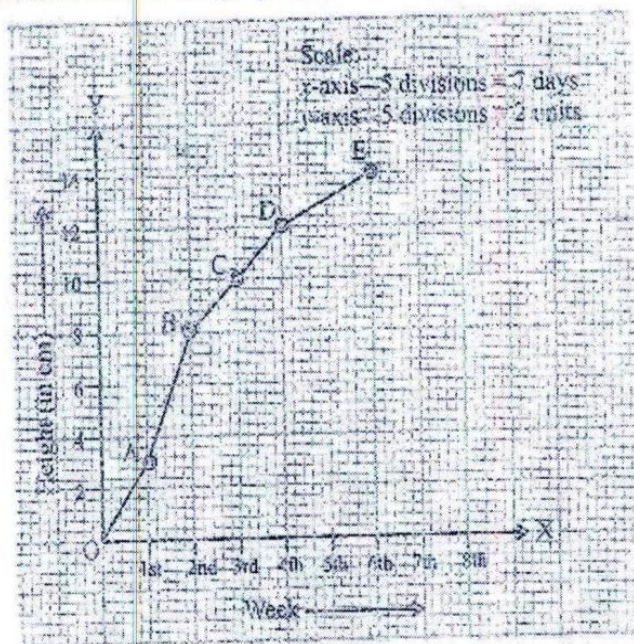
6. Draw the graph between side of a cube and volume of a cube.

Side in cm	2	3	4	5
Vol in cm^3	8	27	64	125

7. Plot the graph of 7 and its multiples.

Is it a linear graph.

1. The growth of a plant was recorded as a graph shown below.



Read it carefully and find.

- At the end of which week(s) was the plant no more than 12 cm?
- Between which two weeks was there the greatest increase in height?
- How much did the plant grow from 3rd week to 4th week?

2. A distance-time table of a moving car is given below.

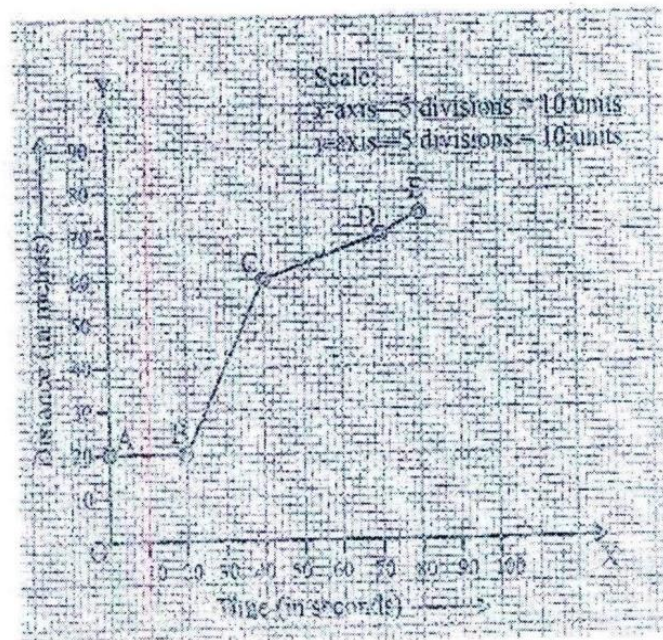
Time	10:20 a.m.	10:30 a.m.	10:40 a.m.	10:50 a.m.	11:00 a.m.	11:10 a.m.	11:20 a.m.
Distance (in km)	0	5	12	22	26	28	38

- Using graph paper, plot the graph of distance versus time.
- When was the car travelling at the greatest speed?
- What is the speed between 10:40 to 10:50 a.m.?
- What is the average speed of the car?

[Hint: Average speed = Total distance travelled / total time taken.]

3. Read the following distance-time graph of a car and find.

- Distance travelled from C to E.
- Speed of the car between 20 – 40 seconds.
- When is the speed of the car zero?



I. Multiple Choice Questions.

1. The x -coordinate of an ordered pair is called:

- (i) ordinate (ii) abscissa (iii) intercept (iv) origin

2. A linear function is denoted by:

- (i) $x = y + 2$ (ii) $2 = b - a$ (iii) $a = cx + yb$ (iv) $y = mx + c$

3. The coordinate $P(3, 0)$ lies on:

- (i) origin (ii) x -axis (iii) y -axis (iv) none of these

4. The coordinate $(-2, 3)$ lies in:

- (i) 1st quadrant (ii) 3rd quadrant (iii) 2nd quadrant (iv) 4th quadrant

5. The Cartesian plane has:

- (i) 2 quadrants (ii) 3 quadrants (iii) 4 quadrants (iv) 5 quadrants

II. Fill in the blanks.

6. The signs of a coordinate in 2nd quadrant are _____.

7. The ordered pair of origin 'O' is written as _____.

8. The coordinate $T(-3, -5)$ lies in _____ quadrant.

9. The horizontal axis of a Cartesian plane is called _____.

10. The coordinate $L(0, -7)$ lies in/on _____.

III. Tick (✓) for 'True' and (✗) for 'False'.

11. The origin of the axes system lies in 1st quadrant.

12. The linear graphs are represented as lines.

13. The quadrants of the Cartesian plane are named in clockwise direction.

14. The vertical axis of the Cartesian plane is denoted as 'YOY'.

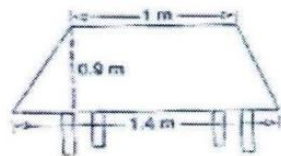
15. In $P(x, y)$, y is the abscissa.

Chap. 11. MENSURATION

- The curved surface area of a 10 m high cylinder is 440 m^2 . Find the volume of the cylinder.
- A rectangular vessel of dimensions 20 cm by 15 cm by 11 cm is full of water. If the water is poured into an empty cylindrical vessel of radius 10 cm, find the height of water in the cylindrical vessel.
- Find the volumes, the curved surface areas and the total surface areas of the cylinders having dimensions:
- (i) $r = 5 \text{ cm}$, $h = 21 \text{ cm}$ (ii) $r = 8.5 \text{ cm}$, $h = 35 \text{ cm}$ (iii) $r = 12 \text{ cm}$, $h = 4 \text{ cm}$
- The volume of a 5 cm long cylindrical iron rod is 6930 cm^3 . Find its diameter.
- The circumference of a base of a cylinder is 176 cm and its height is 60 cm, find the volume of the cylinder.
- A cylindrical tank has a capacity 9240 cm^3 . If its depth is 15 cm, then find its diameter.
- A rectangular piece of paper of dimensions 88 cm by 5 cm is rolled along the length to form a cylinder. Find the volume of the cylinder formed.
8. Find the volume of the cube whose side is
- (i) 5 cm (ii) 6.5 cm (iii) 14 cm (iv) 1.2 m
9. The ratio of the length, breadth and height of a cuboid is 5 : 3 : 2. If its volume is 3750 cm^3 , find the length, breadth and height of the cuboid.
10. The bottom of the tank of a water cooler is rectangular in shape. It is $90 \text{ cm} \times 60 \text{ cm}$. How high it must be made, so that it can hold 162 litres of water?
11. A beam of wood is 5 m long and 36 cm thick. It is made of 1.35 m^3 of wood. What is the width of the beam?
12. The volume of a room is 378 m^3 and the area of its floor is 84 m^2 . Find the height of the room.
13. A swimming pool is 260 m long and 140 m wide. If 54600 cubic metres of water is pumped into it, find the height of the water level in it.
14. Find the volume of wood used to make a closed box of outer dimensions $60 \text{ cm} \times 45 \text{ cm} \times 32 \text{ cm}$, the thickness of wood being 2.5 cm all around.
15. Find the volume of iron required to make an open box whose external dimensions are $36 \text{ cm} \times 25 \text{ cm} \times 16.5 \text{ cm}$, the box being 1.5 cm thick throughout. If 1 cm^3 of iron weighs 8.5 grams, find the weight of the empty box in kilograms.
16. A box with a lid is made of wood which is 3 cm thick. Its external length, breadth and height are 56 cm, 39 cm and 30 cm respectively. Find the capacity of the box. Also find the volume of wood used to make the box.
17. The external dimensions of a closed wooden box are 62 cm, 30 cm and 18 cm. If the box is made of 2-cm-thick wood, find the capacity of the box.
18. A closed wooden box 80 cm long, 65 cm wide and 45 cm high, is made of 2.5-cm-thick wood. Find the capacity of the box and its weight if 100 cm^3 of wood weighs 8 g.
19. Find the volume, lateral surface area and the total surface area of a cube each of whose edges measures: (i) 7 m (ii) 5.6 cm (iii) 8 dm 5 cm
20. The surface area of a cube is 1176 cm^2 . Find its volume.
21. The volume of a cube is 729 cm^3 . Find its surface area.
22. The dimensions of a metal block are 2.25 m by 1.5 m by 27 cm. It is melted and recast into cubes, each of side 45 cm. How many cubes are formed?
23. If the length of each edge of a cube is doubled, how many times does its volume become? How many times does its surface area become?
24. A solid cubical block of fine wood costs ₹ 256 at ₹ 500 per m^3 . Find its volume and the length of each side.

MENSURATION

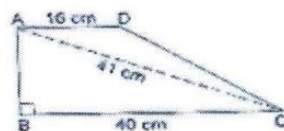
- Find the area of a trapezium whose parallel sides are 24 cm and 20 cm and the distance between them is 15 cm.
- Find the area of a trapezium whose parallel sides are 38.7 cm and 22.3 cm, and the distance between them is 18 cm.
- The shape of the top surface of a table is trapezium. Its parallel sides are 1 m and 1.4 m and the perpendicular distance between them is 0.9 m. Find its area.



- The area of a trapezium is 1080 cm^2 . If the lengths of its parallel sides be 55 cm and 35 cm, find the distance between them.
- A field is in the form of a trapezium. Its area is 1586 m^2 and the distance between its parallel sides is 26 m. If one of the parallel sides is 84 m, find the other.
- The area of a trapezium is 405 cm^2 . Its parallel sides are in the ratio 4 : 5 and the distance between them is 18 cm. Find the length of each of the parallel sides.
- The area of a trapezium is 180 cm^2 and its height is 9 cm. If one of the parallel sides is longer than the other by 6 cm, find the two parallel sides.
- In a trapezium-shaped field, one of the parallel sides is twice the other. If the area of the field is 9450 m^2 and the perpendicular distance between the two parallel sides is 84 m, find the length of the longer of the parallel sides.
- The length of the fence of a trapezium-shaped field ABCD is 130 m and side AB is perpendicular to each of the parallel sides AD and BC. If $BC = 54 \text{ m}$, $CD = 19 \text{ m}$ and $AD = 42 \text{ m}$, find the area of the field.



- In the given figure, ABCD is a trapezium in which $AD \parallel BC$, $\angle ABC = 90^\circ$, $AD = 16 \text{ cm}$, $AC = 41 \text{ cm}$ and $BC = 40 \text{ cm}$. Find the area of the trapezium.
Sol. $AB^2 = (AC^2 - BC^2)$.



- The parallel sides of a trapezium are 20 cm and 10 cm. Its nonparallel sides are both equal, each being 13 cm. Find the area of the trapezium.
- The parallel sides of a trapezium are 25 cm and 11 cm, while its nonparallel sides are 15 cm and 13 cm. Find the area of the trapezium.

13 A rectangular water tank is 12 m long and 8 m wide. If it contains a maximum of 480000 l of water, what is its depth?

14 Two cubes each of side 5 cm are placed together. Find the volume of cuboid, thus obtained.

15 A box is 54 cm \times 45 cm \times 300 cm. How many soaps can be fitted in it if each measures 9 cm \times 5 cm \times 3 cm?

16 A water reservoir is 2 m long, 1.5 m wide and 1.5 m high. How many litres of water can it hold?

17 A cuboid is made of metal. It is 27 cm \times 18 cm \times 12 cm. It is melted and recast into small cubes with an edge 3 cm in length. How many cubes are made?

18 The cover box of a laptop measures 45 cm by 40 cm by 30 cm. If a cardboard packet contains a maximum of 15 such cover boxes of laptops, find the volume of the cardboard packet.

19 A rectangular block of ice measures 42 cm \times 25 cm \times 18 cm. Calculate its weight in kilograms if 1 cm^3 of ice weighs 0.9 grams.

20 Find the volume of the cuboids whose

(i) $l = 15 \text{ cm}$, $b = 7 \text{ cm}$ and $h = 6 \text{ cm}$

(ii) $l = 2.3 \text{ m}$, $b = 30 \text{ cm}$ and $h = 7 \text{ cm}$

21 Find the number of cubes of 4 cm long that can be made from a cuboid of dimensions 24 cm \times 20 cm \times 12 cm.

22 How many 4 cm long cubes can be cut from a cube whose edges are 20 cm in length?

23 The volume of a cube is 64 cm^3 . Find the length of its edge.

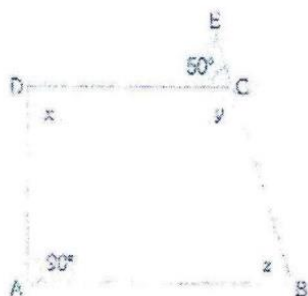
- Find the volume, curved surface area and total surface area of each of the cylinders whose dimensions are:
 - radius of the base = 7 cm and height = 50 cm
 - radius of the base = 5.6 m and height = 1.25 m
 - radius of the base = 14 dm and height = 15 m
- A milk tank is in the form of a cylinder whose radius is 1.5 m and height is 10.5 m. Find the quantity of milk in litres that can be stored in the tank.
- A wooden cylindrical pole is 7 m high and its base radius is 10 cm. Find its weight if the wood weighs 225 kg per cubic metre.
- Find the height of the cylinder whose volume is 1.54 m^3 and diameter of the base is 140 cm?
- The volume of a circular iron rod of length 1 m is 3850 cm^3 . Find its diameter.
- A closed cylindrical tank of diameter 14 m and height 5 m is made from a sheet of metal. How much sheet of metal will be required?
- The circumference of the base of a cylinder is 88 cm and its height is 60 cm. Find the volume of the cylinder and its curved surface area.
- The lateral surface area of a cylinder of length 14 m is 220 m^2 . Find the volume of the cylinder.
- The volume of a cylinder of height 8 cm is 1232 cm^3 . Find its curved surface area and the total surface area.
- The radius and height of a cylinder are in the ratio 7 : 2. If the volume of the cylinder is 8316 cm^3 , find the total surface area of the cylinder.
- The curved surface area of a cylinder is 4400 cm^2 and the circumference of its base is 110 cm. Find the volume of the cylinder.
- A particular brand of talcum powder is available in two packs, a plastic can with a square base of side 5 cm and of height 14 cm, or one with a circular base of radius 3.5 cm and of height 12 cm. Which of them has greater capacity and by how much?
- Find the cost of painting 15 cylindrical pillars of a building at ₹ 2.50 per square metre if the diameter and height of each pillar are 48 cm and 7 metres respectively.
- A rectangular vessel 22 cm by 16 cm by 14 cm is full of water. If the total water is poured into an empty cylindrical vessel of radius 8 cm, find the height of water in the cylindrical vessel.
- A piece of ductile metal is in the form of a cylinder of diameter 1 cm and length 11 cm. It is drawn out into a wire of diameter 1 mm. What will be the length of the wire so obtained?
- A solid cube of metal each of whose sides measures 2.2 cm is melted to form a cylindrical wire of radius 1 mm. Find the length of the wire so obtained.
- How many cubic metres of earth must be dug out to sink a well which is 20 m deep and has a diameter of 7 metres? If the earth so dug out is spread over a rectangular plot 28 m by 11 m, what is the height of the platform so formed?
- A well of inner diameter 14 m is dug to a depth of 12 m. Earth taken out of it has been evenly spread all around it to a width of 7 m to form an embankment. Find the height of the embankment so formed.

$$\text{Ans. Required height} = \frac{\text{volume of earth taken out}}{\pi \times [(14)^2 - (7)^2]}$$

- A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of the road roller is 84 cm and its length is 1 m.

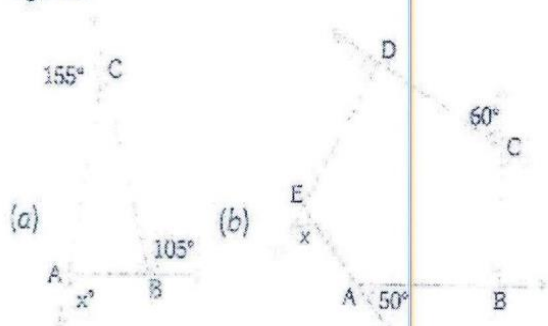
Understanding Quadrilaterals

- A quadrilateral has three acute angles, each measuring 75° . Find its fourth angle.
- The angles of a quadrilateral are in the ratio of $2 : 3 : 3 : 4$. Find the angles of the quadrilateral.
- The adjacent angles of a parallelogram are in the ratio $2 : 3$. Find the angles.
- One side of a parallelogram is 4.8 cm and the other side is $1\frac{1}{2}$ times of this side. Find the perimeter of the parallelogram.
- ABCD is a rhombus. Diagonals AC and BD bisect each other at O such that $AC = 6$ cm and $BD = 8$ cm. Find the side of the rhombus.
- Diagonals of a rhombus are equal. Is this rhombus also a square?
- ABCD is a rectangle, its adjacent sides are in the ratio $3 : 5$ and its perimeter is 48 cm. Find the length of the sides.
- (a) Find the measure of x , y and z in the trapezium ABCD, $AB \parallel CD$ if $\angle A = 90^\circ$ and $\angle C = 50^\circ$.



- (b) If one angle of parallelogram is 130° , find its opposite and adjacent angles

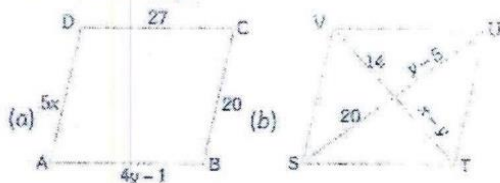
9. Find the value of x in each of the following figures.



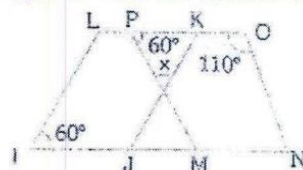
- The sum of two angles of a quadrilateral is 160° . The other two angles are in the ratio $2 : 3$. Find the angles.
- The angles of a quadrilateral are in the ratio $3 : 5 : 7 : 9$. Find the four angles.
- In a quadrilateral PQRS, $\angle P = 3\angle Q$ and $\angle R = 4\angle S$. If $\angle Q = \angle S$, then find all the four angles.
- In figure, ABCD is a quadrilateral with $\angle B = 65^\circ$ and $\angle D = 105^\circ$. If $\angle A$ and $\angle C$ are in the ratio $3 : 7$, find the value of x and y .



- Find the measure of each exterior angle of a regular polygon of
 - 36 sides
 - 40 sides.
- Each interior angle of a regular polygon is 140° . Find the number of its sides.
- The four angles of a quadrilateral are in the ratio $3 : 4 : 5 : 6$. Find its angles.
- Three angles of a quadrilateral are equal, fourth angle is a right angle. Find the measures of the angles. Classify the quadrilateral as convex, concave, trapezium etc.
- If the following quadrilaterals are parallelograms then find x and y .

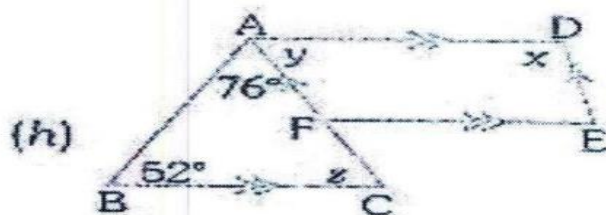
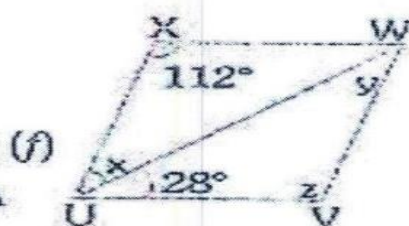
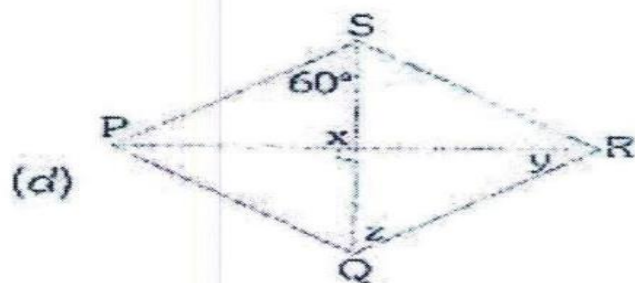
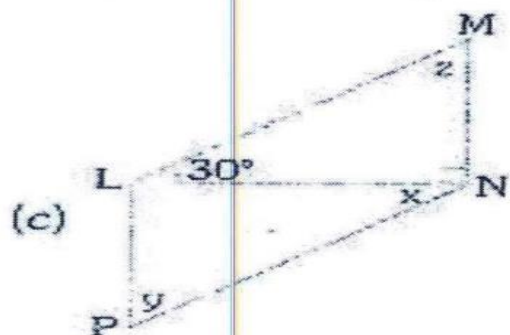


16. In the following figure IJKL and MNOP are parallelograms. Find the measure of x .

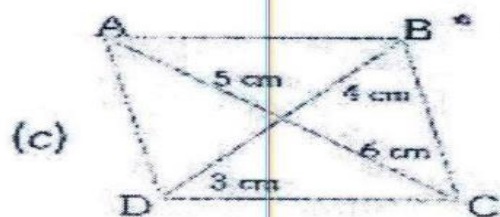
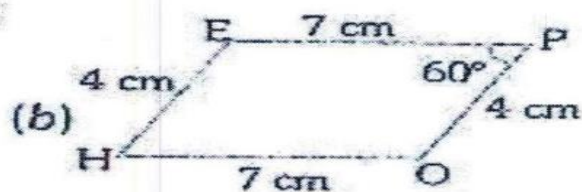
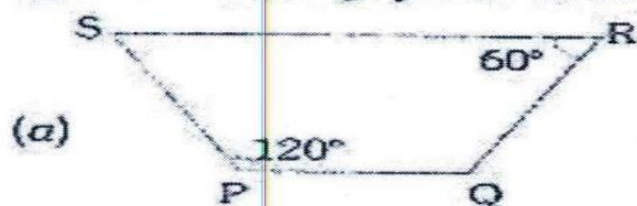


- Two opposite angles of a parallelogram are $(4x - 5)^\circ$ and $(60 - x)^\circ$. Find the measure of each angle of the parallelogram.
- Lengths of two adjacent sides of parallelogram are 4 cm and 5 cm. Find the perimeter of the parallelogram.
- The perimeter of a parallelogram is 36 cm. The smaller side is 8 cm long. Find the length of its longer side.
- In a parallelogram PQRS, the diagonals intersect at O. $PR = 7.4$ cm and $QS = 6.2$ cm. Find the lengths of OR and OS.

24. If two adjacent angles of a parallelogram are equal, what do you call such a parallelogram?
25. The measure of an angle of a parallelogram is 70° . Find its remaining angles.
26. The following quadrilaterals are parallelogram. Find the degree values of the unknowns, x , y , z .



27. Can the following quadrilaterals be parallelograms? Justify your answer.



Chap. 14. FACTORISATION

Factorise:

- (i) $12x + 15$
- (i) $16a^2 - 24ab$
- (i) $24x^3 - 36x^2y$
- (i) $9x^3 - 6x^2 + 12x$
- (i) $14x^3 + 21x^2y - 28x^2y^2$
- (i) $x(x+3) + 5(x+3)$
- $6a(a-2b) + 5b(a-2b)$
- $(x+5)^2 - 4(x+5)$
- $16(2p-3q)^2 - 4(2p-3q)$
- $(x+y)(2x+5) - (x+y)(x+3)$
- $ab^2 - bc^2 - ab + c^2$
- $(x-2y)^2 + 4x - 8y$
- $ab^2 + (a-1)b - 1$
- $x^2 - x(a+2b) + 2ab$

- $14m - 21$
- $15ab^2 - 20a^2b$
- $10x^3 - 15x^2$
- $8x^2 - 72xy + 12x$
- $-5 - 10t + 20t^2$
- $5x(x-4) - 7(x-4)$
- $x^3(2a-b) + x^2(2a-b)$
- $3(a-2b)^2 - 5(a-2b)$
- $x(a-3) + y(3-a)$
- $ar + br + at + bt$
- $x^2 - xz + xy - yz$
- $y^2 - xy(1-x) - x^3$
- $x^3 - 3x^2 + x - 3$

- $9n - 12n^2$
- $12x^2y^3 - 21x^3y^2$
- $36x^3y - 60x^2y^2z$
- $18a^3b^3 - 27a^2b^3 + 36a^3b^2$
- $2m(1-n) + 3(1-n)$
- $9a(3a-5b) - 12a^2(3a-5b)$
- $2a + 6b - 3(a+3b)^2$
- $12(2x-3y)^2 - 16(3y-2x)$
- $x^2 - ax - bx + ab$
- $6ab - b^2 + 12ac - 2bc$
- $(ax+by)^2 + (bx-ay)^2$
- $ab(x^2+y^2) - xy(a^2+b^2)$

Factorise:

- $x^2 - 36$
- $4x^2 - 9y^2$
- $16a^2 - 144$
- $12x^2 - 27$
- $3x^5 - 48x^3$
- $1 - (b-c)^2$
- $(2x+5y)^2 - 1$
- $x^2 - y^2 - 2y - 1$
- $9a^2 - b^2 + 4b - 4$
- Evaluate $\{(405)^2 - (395)^2\}$.

- $4a^2 - 9$
- $16a^2 - 225b^2$
- $63a^2 - 112b^2$
- $x^3 - 64x$
- $16p^3 - 4p$
- $(2a+3b)^2 - 16c^2$
- $36c^2 - (5a+b)^2$
- $25 - a^2 - b^2 - 2ab$
- $100 - (x-5)^2$
- Evaluate $\{(7.8)^2 - (2.2)^2\}$.

- $81 - 49x^2$
- $9a^2b^2 - 25$
- $20a^2 - 45b^2$
- $16x^5 - 144x^3$
- $63a^2b^2 - 7$
- $(l+m)^2 - (l-m)^2$
- $(3x-4y)^2 - 25z^2$
- $25a^2 - 4b^2 + 28bc - 49c^2$

Factorise:

- $x^2 + 8x + 16$
- $9 + 6z + z^2$
- $36a^2 + 36a + 9$
- $49a^2 + 84ab + 36b^2$
- $1 - 6x + 9x^2$
- $m^2 - 4mn + 4n^2$
- $(l+m)^2 - 4lm$

- $x^2 + 14x + 49$
- $x^2 + 6ax + 9a^2$
- $9m^2 + 24m + 16$
- $p^2 - 10p + 25$
- $9y^2 - 12y + 4$
- $a^2b^2 - 6abc + 9c^2$

- $1 + 2x + x^2$
- $4y^2 + 20y + 25$
- $z^2 + z + \frac{1}{4}$
- $121a^2 - 88ab + 16b^2$
- $16x^2 - 24x + 9$
- $m^4 + 2m^2n^2 + n^4$

Factorise:

- $x^2 + 5x + 6$
- $p^2 + 6p + 8$
- $x^2 + 13x + 40$
- $x^2 - 10x + 24$

- $y^2 + 10y + 24$
- $x^2 + 15x + 56$
- $q^2 - 10q + 21$
- $x^2 - 23x + 42$

- $z^2 + 12z + 27$
- $y^2 + 19y + 60$
- $p^2 + 6p - 16$
- $x^2 - 17x + 16$

What. Given exp. $= l^2 + m^2 - 2lm - 4lm = (l^2 + m^2 - 2lm)$.

13. $y^2 - 21y + 90$
 13. $x^2 + x - 132$
 19. $z^2 + 19z - 150$
 22. $p^2 - 4p - 77$
 25. $x^2 - 5x - 24$
 28. $x^2 - 4x - 12$
 31. $3z^2 - 10z + 8$
 34. $2x^2 - 17x - 30$
 37. $3 + 23z - 8z^2$
 40. $4n^2 - 8n + 3$

14. $x^2 - 22x + 117$
 17. $x^2 + 5x - 104$
 20. $y^2 + y - 72$
 23. $x^2 - 7x - 30$
 26. $y^2 - 6y - 135$
 29. $3x^2 + 10x + 8$
 32. $2x^2 + x - 45$
 35. $7y^2 - 19y - 6$
 38. $6x^2 - 5x - 6$
 41. $6x^2 - 17x - 3$

15. $x^2 - 9x + 20$
 18. $y^2 + 7y - 144$
 21. $a^2 + 6a - 91$
 24. $x^2 - 11x - 42$
 27. $z^2 - 12z - 45$
 30. $3y^2 + 14y + 8$
 33. $6p^2 + 11p - 10$
 36. $28 - 31x - 5x^2$
 39. $3m^2 + 24m + 36$
 42. $7x^2 - 19x - 6$



OBJECTIVE QUESTIONS

Tick (✓) the correct answer in each of the following:

1. $(7a^2 - 63b^2) = ?$
 - (a) $(7a - 9b)(9a + 7b)$
 - (b) $(7a - 9b)(7a + 9b)$
 - (c) $9(a - 3b)(a + 3b)$
 - (d) $7(a - 3b)(a + 3b)$
2. $(2x - 32x^3) = ?$
 - (a) $2(x - 4)(x + 4)$
 - (b) $2x(1 - 2x)^2$
 - (c) $2x(1 + 2x)^2$
 - (d) $2x(1 - 4x)(1 + 4x)$
3. $x^3 - 144x = ?$
 - (a) $x(x - 12)^2$
 - (b) $x(x + 12)^2$
 - (c) $x(x - 12)(x + 12)$
 - (d) none of these
4. $(2 - 50x^2) = ?$
 - (a) $2(1 - 5x)^2$
 - (b) $2(1 + 5x)^2$
 - (c) $(2 - 5x)(2 + 5x)$
 - (d) $2(1 - 5x)(1 + 5x)$
5. $a^2 + bc + ab + ac = ?$
 - (a) $(a + b)(a + c)$
 - (b) $(a + b)(b + c)$
 - (c) $(b + c)(c + a)$
 - (d) $a(a + b + c)$
6. $pq^2 + q(p - 1) - 1 = ?$
 - (a) $(pq + 1)(q - 1)$
 - (b) $p(q + 1)(q - 1)$
 - (c) $q(p - 1)(q + 1)$
 - (d) $(pq - 1)(q + 1)$
7. $ab - mn + an - bm = ?$
 - (a) $(a - b)(m - n)$
 - (b) $(a - m)(b + n)$
 - (c) $(a - n)(m + b)$
 - (d) $(m - a)(n - b)$
8. $ab - a - b + 1 = ?$
 - (a) $(a - 1)(b - 1)$
 - (b) $(1 - a)(1 - b)$
 - (c) $(a - 1)(1 - b)$
 - (d) $(1 - a)(b - 1)$
9. $x^2 - xz + xy - yz = ?$
 - (a) $(x - y)(x + z)$
 - (b) $(x - y)(x - z)$
 - (c) $(x + y)(x - z)$
 - (d) $(x - y)(z - x)$

Chap. 9 ALGEBRAIC EXPRESSIONS AND IDENTITIES

1. Multiply the following.

- (i) $11x^2y$ and $2x^2y^2$ (ii) $3y^2$ and $7y^5$ (iii) $5x^3$ and $4x^9$ (iv) $-9xy$ and $4x^2z$

2. Find the products of.

- (i) $(-2xy^2)(5y)(-3z^2)$ (ii) $(ab)(bc)(ca)$
 (iii) $(6a^2b)(-2b^2c)(3ac^2)$ (iv) $\left(\frac{5}{9}ab\right)\left(\frac{9}{7}bc\right)\left(\frac{-7}{5}ca\right)$

3. Find the value of $(3p^2q) \times (8q^3)$, when $p = 1$ and $q = \left(-\frac{1}{4}\right)$.

4. Find the value of $(-8x^2y^3) \times \left(\frac{1}{5}xy^2\right)$, when $x = -1$ and $y = 2$.

5. Find the product of $(3a^2b^3)$, $(-7a^2)$ and $(5a^2b^2)$, and then verify the result for $a = 2$ and $b = 3$.

6. Find the product of $\left(-\frac{3}{4}xy^2z\right)$ and $(-2z^2)$, then verify the result for $x = 1$, $y = 2$ and $z = 3$.

7. Verify $a^2b^2c^2 = (ab) \times (bc) \times (ca)$, for $a = 3$ and $b = 4$.

8. Find the product and then verify the following for $a = 2$ and $b = -5$.

- (i) $a(a^2 - ab^2)$ (ii) $\frac{2}{7}a\left(ab - \frac{7}{6}ab^2\right)$

9. Find the product of the following.

- (i) $2x(3x + y^2)$ (ii) $(-3y)(x^2 + 3xy)$
 (iii) $3a^2(4a - 5a^2)$ (iv) $-8a^2b(-3a^2 - 2b)$
 (v) $\frac{-5}{9}abc\left(\frac{18}{15}a^2bc - \frac{3}{10}abc^2\right)$ (vi) $7a(0.1a^2 - 0.5b)$

10. Multiply $\frac{5}{9}y^2z$, $\frac{7}{10}x^2$ and $(-3xz^2)$, and then verify the result for $x = \frac{1}{2}$, $y = \frac{1}{3}$ and $z = \frac{1}{4}$.

11. Find the following products and verify the results for $x = -1$ and $y = -2$.

- (i) $(3x^2 + 2y^2)(x + y)$ (ii) $(x^2 - y^2)(x^2 + y^2)$
 (iii) $\left(3x^2 + \frac{1}{3}y^2\right)(2y - 3x^2)$ (iv) $(x^4 - y^4)(x + y)$
 (v) $\left(\frac{1}{2}x - y\right)\left(\frac{3}{5}x + y\right)$ (vi) $(0.7x - 0.6y)(2.3x - 2y)$

12. Find the products of the following.

- (i) $(3x - 2)(5x^2 + 6x + 2)$ (ii) $(x^2 + y^2 + z^2)(xy + yz)$
 (iii) $(x + y)(x^2 - xy + y^2)$ (iv) $(5x^2 + y)(3x + 2y)$
 (v) $(x^3 + y^3)(x^2 - xy + y^2)$ (vi) $\left(\frac{3}{5}x^2 - 3y + 2\right)\left(\frac{1}{3}x - y\right)$

13. Simplify.

- (i) $(3y + 2)(y - 2) - (7y + 3)(y - 4)$ (ii) $(2x - 3y)(x + y) - (5x + 2y)(x - y)$
 (iii) $x^2 + (3x - y)(3x + y + y^2)$ (iv) $(a^2 - 3a + 5)(2a - 3) - (5a^2 + 3a - 3)(a - 1)$

14. Find the products of the following.

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

(ii) $(x - 3y)(x^2 + 3xy)$

(iii) $\left(x^3 + \frac{1}{x^2}\right)\left(z + \frac{1}{2}\right)$

(iv) $(x^2 - a^2)(x - a)$

(v) $\left(\frac{2}{7}x + \frac{3}{5}y\right)(x^2 + y^2)$

(vi) $(a^2b + ab^2)(b^2c + c^2b)$

15. Find the following products by using identities

(i) $(5x + 9)(5x - 9)$

(ii) $(x^3 + y^2)(x^3 - y^2)$

(iii) $(x^2y + 3z)(x^2y - 3z)$

(iv) $\left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)$

16. Find the following products.

(i) $(5x - 3y)(5x - 3y)$

(ii) $(y - 3)(y - 3)$

(iii) $(x^2 - 5)(x^2 - 5)$

(iv) $\left(\frac{3}{4}x - \frac{5}{6}y\right)\left(\frac{3}{4}x - \frac{5}{6}y\right)$

17. Find the following products.

(i) $(x + 3)(x + 3)$

(ii) $(2a + 3b)(2a + 3b)$

(iii) $\left(\frac{7}{9}x + y\right)\left(\frac{7}{9}x + y\right)$

(iv) $\left(\frac{2}{3}x + 5\right)\left(\frac{2}{3}x + 5\right)$

18. Simplify using identities.

(i) $133 \times 133 - 121 \times 121$

(ii) $5.89 \times 5.89 - 0.11 \times 0.11$

(iii) $\frac{93 \times 93 - 5 \times 5}{88}$

(iv) $\frac{3.29 \times 3.29 - 0.17 \times 0.17}{3.12}$

19. Find the value of the expression $36x^2 + 60xy + 25y^2$, when $x = 4$ and $y = -7$.

20. Find the value of the following expressions, when $x = 4$ and $y = 7$.

(i) $49x^2 + 126xy + 81y^2$

(ii) $4x^2 - 12xy + 9y^2$

(iii) $(x^2 - y^2)$

21. If $\left(x + \frac{1}{x}\right) = 3$, find the value of $\left(x^2 + \frac{1}{x^2}\right)$.

22. Using the identities, evaluate the following.

(i) 102^2

(ii) 311^2

(iii) 72^2

(iv) 89^2

(v) 118^2

(vi) 989^2

(vii) 13×7

(viii) 73×67

(ix) 9.3×8.7

(x) 12.5×11.5

(xi) 105×95

(xii) 153×147

INTERNATIONAL INDIAN SCHOOL
WORKSHEET VIII STD – 2015 [SA2]

CH-13 DIRECT AND INVERSE PROPORTIONS

1. In which of the following cases is there direct variation between the two given quantities? (Do not carry out any calculations)
 - (a) 10 workers finish a job in 6 days. In how many days will 20 workers finish the same job?
 - (b) A car runs at a uniform speed. If it covers 135 km in 3 hours, how much distance will it cover in 2 hours?
 - (c) A tap can completely fill a tank in $11\frac{1}{2}$ hours. How much of it can be filled in $\frac{3}{4}$ hours?
 - (d) Curtain cloth was purchased at Rs. 230 per meter. How much will 12 meters of cloth cost?
2. If the mass of 35 sheets of paper is 280 g, how many sheets will weigh 7.2 kg?
3. A family's expenses for 4 weeks 5 days amount to RS1980. What is their expense at the same rate for 6 weeks 2 days?
4. If 25 workers can finish a job in 40 days, how many workers will complete the same job in 25 days?
5. 40 kg of rice lasts 30 days in a family of 8 persons. If 2 guests stay with the family, how many days will 40 kg of rice last?
6. If Ram works 10 hours per day, he can finish a job in 28 days. If he has to finish the job in 20 days, how many hours should he work per day?
7. The cost of 18 notebooks is Rs.423. Find the cost of 20 notebooks.

8. 24 oranges can be packed 4 cartons. How many oranges can be packed in 12 cartons?

9. Check whether the given quantities are in proportion or not: page - 9

a) 11, 22, 17 and 36

b) 12, 24, 36 and 48

10) If 18 notebooks cost RS.1170. How much 25 will books cost?

11) In which of the following cases do the two quantities x & y vary inversely?

(a).

x	1	2	4	8	10
y	800	400	200	100	80

x	2	4	5	8	10
y	200	100	80	50	40

 (b)

12). X & y vary inversely. Complete the following table.

X	10	5	8		20
y	12	24		30	

13). Two quantities x & y vary directly. Complete the table.

X	6	8				18		24
y	12	16	18	24	32		40	

14. Check whether x & y vary inversely or not.

X	2	12	60	4	5	7.5	3
y	30	5	1	15	12	8	20

x	7	4	3	5	21	6	9
y	6	8	14	16	2	7	5

15. Complete the table if x & y vary inversely.

X	3	6		5	1.5	10
y	10	5	2			

16. A car travels 286 kms on 26 liters of petrol. How far will it travel on 36 liters.

17. A Map is drawn on a scale of 1cm: 1000km, if the distance on the map between the 2 cities is 5cm. What is the actual distance between them?

18. The S.I. on a certain sum is Rs.300.00 for two years. Find the S.I. on the same sum for 6-years at the same rate.

19. A family of 16 had enough food to last them for 20-days. If 4 guests arrived suddenly, for how long will the amount of food last?

20. 26-men can do a piece of work in 18-days. If the work is to be completed in 13-days, how many more men need to be hired?

21. At the speed of 18 km/hr. a cyclist covers the distance in 190 minutes. At what speed can he cover the same distance in 3 hrs.

22. If thirty men can do a piece of work in 15 days, in how many days will 25 men do it?

23. A car with the speed of 60 km/hour completes a journey in 3 hrs. if the journey can be completed in 4 hrs., what can be the speed of the car.

Prepared By Mrs RABIATH REFAI

VI—VIII Girls Section.

CHAPTER -12 - EXPONENTS AND POWERS

1. Find the multiplicative inverse of the following:

a) 3^{-4} b) 7^{-2} c) 9^{-9} d) 10^{-80}

2. Expand the following numbers using exponents

a) 18964.63 b) 7064.373

3. Simplify and write in exponential form

a) $(-3)^{-3} \times (-3)^{-2} \times (-3)^{-5}$

b) $a^{-8} \times a^{-10} \times a^{-2}$

4. Express 9^{-3} as a power with the base 3.

5. Find the value of:

a) $\left[\left(\frac{1}{2}\right)^0 + \left(\frac{1}{5}\right)^3 + \left(\frac{2}{3}\right)^2 \right]$

b) $\left[\left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{2}\right)^{-3} \right] \div \left(\frac{1}{4}\right)^{-2}$

c) $\left[\left(\frac{9}{5}\right)^{-8} \times \left(\frac{5}{9}\right)^{-5} \right]$

d) $(9^2 - 4^3) \times \left(\frac{-3}{17}\right)^2 \times \frac{34}{9}$