# Maharashtra State Board
# Class VI Mathematics
# Sample Paper 2
# Solution

**Time: 2 hr 30 min** **Total Marks: 60**

**Q1.**

1. Area of a square = Side$^2$ = (18 m)$^2$ = 324 m$^2$
   So, the area of the square plot is 324 m$^2$.

2. Principal = Rs. 8000
   Interest = Rs. (8480 – 8000) = Rs. 480
   Period = 6 months.

3.

| Points in the interior of ΔXYZ | Points on ΔXYZ | Points in the exterior of ΔXYZ |
|---|---|---|
| Points M and N | Points L and O | Points T and K |

4. The numbers which are greater than –4 and less than +2 are:
   –3, –2, –1, 0, +1

5. $\frac{29}{25} = \frac{29 \times 4}{25 \times 4} = \frac{116}{100} = 116\%$

6. L.H.S. = 2
   $\text{R.H.S.} = \frac{10}{5} = 2$
   Since, L.H.S. = R.H.S., the given statement is an equality and not an equation.
7. The arcs which can be formed in the given circle are:
   arc LMN, arc MNP, arc LNP and arc LMP.

8. There are unlimited number of integers both to the left and the right of zero, hence we cannot determine the biggest or the smallest integer.

9. Angles which are neither angles of the triangle nor its exterior angles are ∠AXB, ∠EYF and ∠CZD.

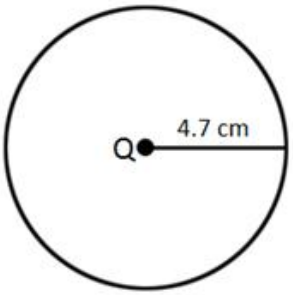
10. In the given algebraic expression, there are 3 terms. Hence, it is a trinomial.

11. Side of the room (l) = 4 m
    Volume of the room = $l^3 = 4^3 = 4 \times 4 \times 4 = 64$ cu. m
    $\therefore$ The room can hold 64 cu. m of air.

12. The magnitude of the number 0 is 0.

**Q2.**

1. Diameter = 9.4 cm
   To draw the circle, we need to know the radius of the circle.
   $\text{Radius} = \frac{\text{Diameter}}{2} = \frac{9.4}{2} = 4.7$ cm
   Take any point, say point Q, on a paper. Using compass, take point Q as the centre with radius 4.7 cm and draw a circle.




2. Length of a rectangle = l = 27 m
   Breadth of a rectangle = b
   Area of a rectangle = 243 sq. m
   Now, area of a rectangle = l x b
   $\therefore$ 243 = 27 x b
   $\therefore b = \frac{243}{27} = 9$
   Thus, the breadth of the rectangle is 9 m.

3. (17mn – 10ab) – (−12ab + 8mn) in a vertical arrangement:

$$\begin{array}{rrrr} & 17mn & - & 10ab \\ - & 8mn & - & 12ab \\ \hline \end{array}$$

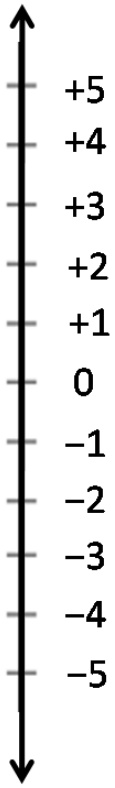
   To subtract an algebraic expression is to add its opposite.

$$\begin{array}{rrrr} & 17mn & - & 10ab \\ + & -8mn & + & 12ab \\ \hline & 9mn & + & 2ab \\ \hline \end{array}$$

   Hence, (17mn – 10ab) – (−12ab + 8mn) = 9mn + 2ab

4. $p + 4 = 11$
   $\therefore p + 4 - 4 = 11 - 4$ [Subtraction property of equality]
   $\therefore p + 0 = 7$ [$\because (-4) + 4 = 0$ and $11 - 4 = 7$]
   $\therefore p = 7$ [$\because$ Any number + 0 = the same]
   When the value of p is 7, the two sides of the equation become equal.
   $\therefore$ 7 is the solution of the given equation.

5. Amount of the bill = Rs. 1250
   Percentage of the tax = 2% of Rs. 1250
   $$= \frac{2}{100} \times 1250$$
   = Rs. 25
   Thus, Sameer's father paid Rs. 25 as tax.

6. 


7. The sum of the measures of the three angles of a triangle is 180°.
   Thus, in ΔRST,
   $m\angle R + m\angle S + m\angle T = 180°$
   $\therefore 70° + 30° + m\angle T = 180°$
   $\therefore 100° + m\angle T = 180°$
   $\therefore m\angle T = 180° - 100° = 80°$

8. For a cuboidal pit, we have
   Length, l = 6 m
   Breadth, b = 5 m
   Height, h = 2.5 m

   Now, volume of a pit = l × b × h = 6 × 5 × 2.5 = 75 $m^3$
   Cost of digging = Rs. 25 per $m^3$

   Therefore, total cost = Rs. 25 × 75 = Rs 1875.

**Q3.**

1. Radius of the circle = $\frac{\text{Diameter}}{2}$

   (i) Diameter = 114 mm

   Radius = $\frac{114}{2}$ mm = 57 mm

   (ii) Diameter = 2.06 cm

   Radius = $\frac{2.06}{2}$ cm = 1.03 cm

   (iii) Diameter = 0.55 m

   Radius = $\frac{0.55}{2}$ m = 0.275 m

2. For a cube,
   Length = l = 20 cm
   ∴ Volume = $l^3 = 20^3 = 8000$ $cm^3$

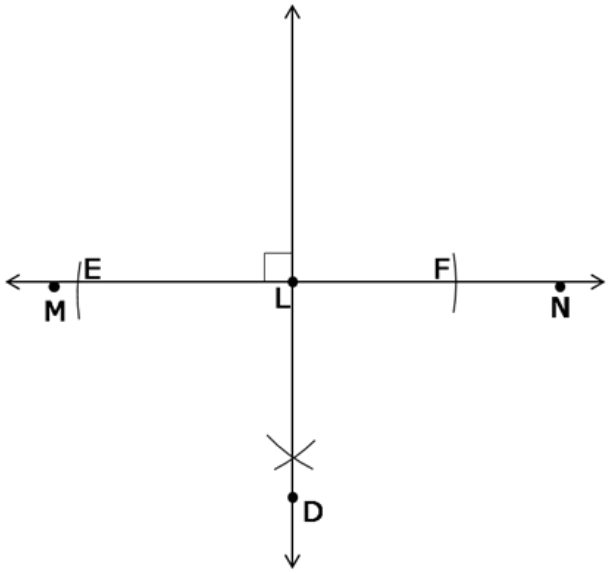
   For a cuboid,
   Length = l = 160 cm
   Breadth = b = 500 cm
   Height = h = 100 cm
   ∴ Volume = l × b × h = 160 × 500 × 100 = 8000000 $cm^3$

   Number of cubes required = $\frac{8000000}{8000} = 1000$

   Hence, 1000 cubes with side 20 cm will be needed to make a cuboid with dimensions 160 cm × 500 cm × 100 cm.

3. [180 + (−15) + 20] − [(−2) × (−11) − (4 + 3)]
   = [(180 − 15) + 20] − [(−2) × (−11) − 7]
   = (165 + 20) − (22 − 7)
   = 185 − 15
   = 170

4. Steps of construction:
   1. Draw a line MN. Take a point L anywhere on the line MN.
   2. Adjust the compass to a convenient span.
   3. Place the point of the compass on L and draw two arcs, one on each side of point L, to intersect line MN at points E and F respectively.
   4. Open the compass to a span a little greater than half the distance between points E and F.
   5. Place the point of the compass first on point E and then on point F and draw two arcs on one side of the line MN, intersecting each other. Name the point of intersection as D.
   6. Draw a line LD.
      Hence, line LD $\perp$ line MN.



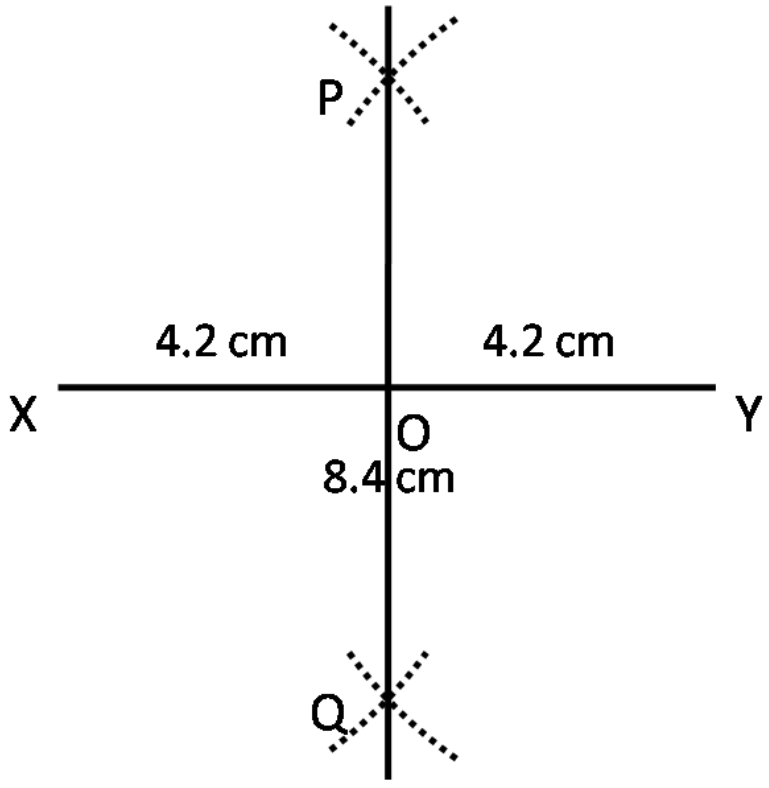

5. The period and the rate of interest remains the same.
   The new principal is Rs. 15000.
   Rs. 15000 is 3 times the old principal of Rs. 5000.
   $\therefore$ Interest also will be 3 times of Rs. 1200
   $\therefore$ Interest on Rs. 15000 = 1200 × 3 = Rs. 3600

6. $(p^2 + 2pq + q^2) + (q^2 - 2pq)$
   Writing the like terms together:
   $p^2 + (2pq - 2pq) + (q^2 + q^2) = p^2 + 0 + 2q^2$
   $= p^2 + 2q^2$
   If p = 3 and q = 5, the value of $p^2 + 2q^2$ can be calculated as follows:
   $p^2 + 2q^2 = (3)^2 + 2(5)^2$
   $= 9 + 2(25)$
   $= 9 + 50$
   $= 59$

7. By the property of exterior angle of a triangle, we have
   $m\angle ACD = m\angle A + m\angle B$
   $\therefore m\angle ACD = m\angle A + m\angle A$ ($\because$ $m\angle A = m\angle B$)
   $\therefore m\angle ACD = 2 \times m\angle A$
   $\therefore 140° = 2 \times m\angle A$
   $\therefore m\angle A = 70°$ (dividing both sides by 2)
   $\therefore m\angle A = m\angle B = 70°$

**Q4.**

1. Steps of construction:
   1. Draw a segment XY of length 8.4 cm.
   2. Open the compass to a span greater than half the length of seg XY.
   3. Taking X as the centre, draw an arc on each side of seg XY.
   4. Now, keeping the same span and taking Y as the centre, draw an arc on each side of seg XY to intersect the previous arcs.
   5. Name the points of intersection as P and Q.
   6. Draw the line PQ.
      Hence, PQ is the perpendicular bisector of seg XY.
      PQ intersects segment XY at point O.
      OX = 4.2 cm
      OY = 4.2 cm



2. Radius of the given circle = 4.2 cm

$\therefore$ Radius of the bigger circle = 2 × radius of the given circle

= 2 × 4.2 cm

= 8.4 cm

Diameter of the bigger circle = 2 × radius of the bigger circle

= 2 × 8.4 cm

= 16.8 cm

3. Volume = l × b × h

For a cuboidal tank:

Length, l = 10 m = 1000 cm

Breadth, b = 8 m = 800 cm

Height, h = 6 m = 600 cm

For a tetra pack:

Length, l = 4 cm

Breadth, b = 3 cm

Height, h = 10 cm

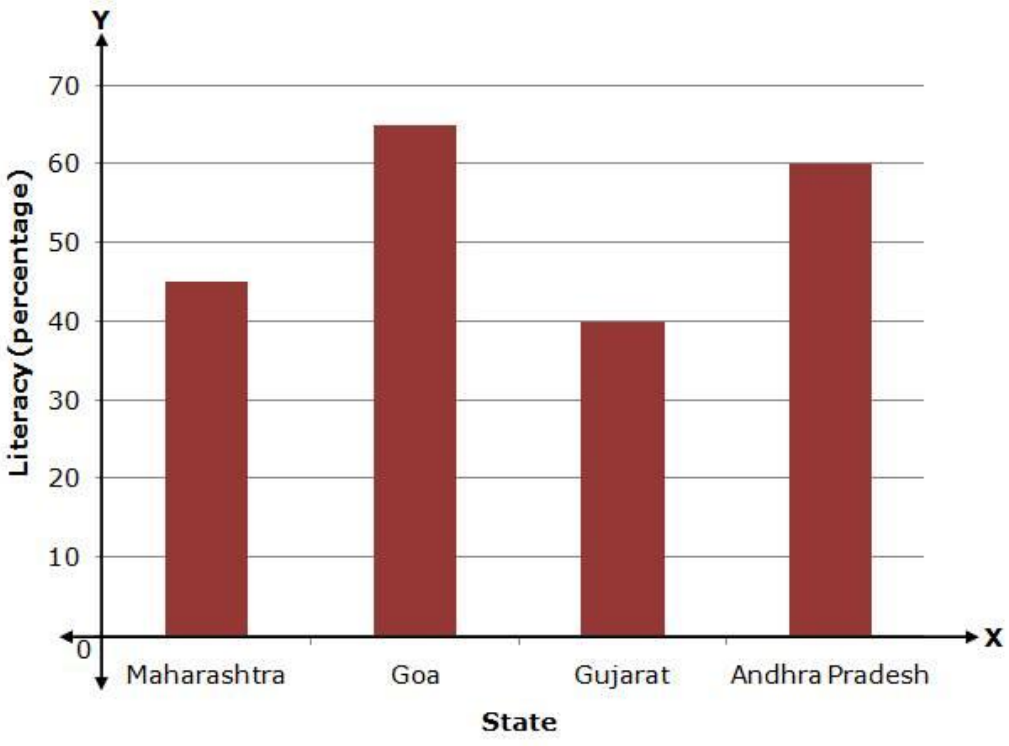
$$\text{Number of tetra packs that can be made} = \frac{\text{Volume of the tank}}{\text{Volume of 1 tetra pack}}$$

$$= \frac{1000 \times 800 \times 600}{4 \times 3 \times 10}$$

$$= 40,00,000$$

Hence, 40,00,000 tetra packs of juice can be made.

4.



5. Rate of interest = 5 p.c.p.a.
   ∴ Interest on a principal of Rs. 100 for 1 year = Rs. 5
   ∴ Interest on a principal of Rs. 100 for 6 years = Rs. (5 × 6) = Rs. 30.
   Now, 3500 is 35 times Rs. 100.
   ∴ Interest on Rs. 3500 for 6 years = Rs. 30 × 35 = Rs. 1050.

**Q5.**

1. Area of the walls = length × breadth
   So, area of the first set of walls = 15 m × 20 m = 300 $m^2$
   So, the area of one wall is 300 $m^2$.
   Area of two walls of the same measurement = (300 × 2) $m^2$ = 600 $m^2$
   So, the area of the two walls measuring 15 m long and 20 m wide is 600 $m^2$.

   Area of the second set of walls = 15 m × 15 m = 225 $m^2$
   So, the area of one wall is 225 $m^2$.
   Area of two walls of the same measurement = (225 × 2) $m^2$ = 450 $m^2$
   So, the area of the two walls measuring 15 m long and 15 wide is 450 $m^2$.

   Total area to be painted = (600 + 450) $m^2$ = 1050 $m^2$
   Given, one can of paint is sufficient for 25 $m^2$.
   So, for 1050 $m^2$, Piyush will need 1050 ÷ 25 = 42 cans
   Hence, Piyush will need 42 cans of paint to paint the walls of his house.

2.