Maharashtra Board Class VII Mathematics Board Paper – 2 Solution

Q1.

y - 2 = 9
∴ y - 2 + 2 = 9 + 2
∴ y = 11
∴ the solution of the equation y - 2 = 9 is 11.

2.
$$7^{19} \div 7^4 = \frac{7^{19}}{7^4} = 7^{19-4} = 7^{15}$$

$$3. \quad \frac{5}{9} + \frac{8}{9} = \frac{5+8}{9} = \frac{13}{9}$$

4.
$$2\frac{1}{4} = \frac{9}{4}$$

 $\sqrt{\frac{9}{4}} = \sqrt{\frac{3 \times 3}{2 \times 2}} = \frac{3}{2}$

- **5.** $4 \times (x + 2) = 4x + 4 \times 2 = 4x + 8$
- **6.** Given, Cost Price (C.P.) = Rs. 70, Selling Price (S.P.) = Rs. 90 Profit = Selling Price – Cost Price = 90 – 70 = 20
- Given, Side = 48.2 cm
 Thus, area of a square = (Side)² = (48.2)² = 2323.24 sq. cm
- 8. Given, ∠XZP = 100°. Angles in the same segments are congruent. \therefore m∠XZP = 100°
- **9.** Given, side = l = 5.5 cm Total surface area of a cube = $6l^2 = 6 \times 5.5 \times 5.5 = 181.5$ sq. cm
- **10.**Given, length = 7 cm and breadth = 9 cm Now, area of a rectangle = length × breadth = 7 cm × 9 cm = 63 sq. cm

11.Given, Principal = Rs. 1260 and Interest = Rs. 126 Amount = Principal + Interest = 1260 + 126 = Rs. 1386

$$12.(-5.13)^2 = (-5.13) \times (-5.13) = 26.3169$$

Q2.

- **1.** Area of the floor = $(side)^2 = (6.5)^2 = 42.25$ sq. m Perimeter of the floor = 4(side) = 4(6.5) = 26 m
- 2. $4(y^2 2y + 7)$ = $(4 \times y^2) - (4 \times 2y) + (4 \times 7)$ = $4y^2 - 8y + 28$
- 3. The sum of the measure of the angles of a quadrilateral is 360°. Given, the measure of one angle is 100°.
 ∴ The sum of the measure of the remaining angles of the quadrilateral = 360° 100° = 260°
- 4. Number of days = 5 Total income of the vegetable vendor = 73 + 79 + 81 + 77 + 75 = Rs. 385 ∴ Average daily income = $\frac{385}{5}$ = Rs. 77
- 5. Diameter of an atom of gold = 0.00000000003 cm $0.00000000003 = \frac{3}{100000000000} = \frac{3}{10^{12}} = 3 \times 10^{-12} \text{ cm}$
- 6. Given, One side = 18 and Other side = 24 By Pythagoras theorem, (Hypotenuse)² = (One side)² + (Other side)² \Rightarrow (Hypotenuse)² = (18)² + (24)² \Rightarrow (Hypotenuse)² = 324 + 576 \Rightarrow (Hypotenuse)² = 900 \Rightarrow (Hypotenuse) = 30
- 7. Let x be the length of a side of an equilateral triangle. The perimeter of an equilateral triangle = 3 × side According to the given condition, 3 × x = 57 But, 3 × 19 = 57 ∴ x = 19
 - \therefore The length of the side of the equilateral triangle is 19 cm.

8. Given, l = 7.5 m, b = 2.4 m and h = 3 m Volume of the tank = l × b × h = 7.5 × 2.4 × 3 = 54 cu. m

Q3.

- **1.** Steps of construction:
 - (a) Draw seg JN of length 6.2 cm.
 - (b) Taking J as centre and radius as 6.2 cm, draw an arc on one side of seg JN.
 - (c) Taking N as centre and radius as 6.2 cm, draw another arc intersecting the first arc at point 'V'.
 - (d) Jon seg VJ and seg VN. Thus, Δ VJN is the required triangle.



- 2. The sides of the triangle forming the right angle are 15 m and 8 m respectively. The diagonal of the rectangle is the hypotenuse of the right angled triangle. Thus, (Diagonal)² = (Hypotenuse)² = (One side)² + (Other side)² ⇒ (Diagonal)² = (15)² + (8)² = 225 + 64 = 289
 ∴ (Diagonal)² = (17)²
 ∴ Diagonal = 17 m
 Thus, the length of the diagonal of the rectangular piece of land is 17 m.
- 3. The length of the longest side = side KM = 15 cm
 ⇒ (15)² = 225(i)
 The length of the other two sides are *l*(KL) = 9 cm and *l*(LM) = 12 cm
 The sum of their squares = (9)² + (12)² = 81 + 144 = 225(ii)
 ∴ [*l*(KM)]² = [*l*(KL)]² + [*l*(LM)]²[From (i) and (ii)]
 We observe that the square of side KM is equal to the sum of the squares of the

other two sides KL and LM. $\therefore \Delta$ KLM is a right-angled triangle and side KM is the hypotenuse. The angle opposite to the hypotenuse is a right angle.

 $\therefore \angle L$ is the right angle.

 Δ KLM is a right angled triangle and m \angle L = 90°

4. Length of the floor = 6.6 m = 660 cm and Breath of the floor = 4.5 m = 450 cm Area of the floor = $1 \times b = 600 \times 450$ sq. cm Area of the square tile = $(side)^2 = 30 \times 30$ sq.cm Now, number of tiles required = $\frac{\text{Area of the floor}}{\text{Area of the square tile}} = \frac{600 \times 450}{30 \times 30} = 300$

Thus, 300 tiles are required.

5. Loss = 12%

On C.P. of Rs. 100, the loss is Rs. 12. S.P. = C.P. – Loss = 100 - 12 = Rs. 88C.P. of the washing machine = 10000Let the selling price (S.P.) of the machine be x. Ratio of the selling price = Ratio of the Cost price

$$\Rightarrow \frac{x}{88} = \frac{10000}{100}$$
$$\Rightarrow \frac{x}{88} = 100$$
$$\Rightarrow x = 100 \times 88 \Rightarrow x = 8800$$
Thus, the selling price of a washing machine is Rs. 8800.

- **6.** Steps of construction:
 - (a) Draw seg VW = 7 cm.
 - (b) Draw a ray VX through point V such that $m \angle XVW = 55^{\circ}$ and a ray WY through point W such that $m \angle YWV = 55^{\circ}$.
 - (c) Name the point of intersection as U. Thus, Δ UVW is the required triangle.



- 7. Given, length = 2.5 m, b = 2 m and h = 2.4 mTotal surface area of the tank = 2(lb + bh + hl)= $2(2.5 \times 2 + 2 \times 2.4 + 2.4 \times 2.5)$ = 2(5.0 + 4.8 + 6.0)
 - = 2 × 15.8
 - = 31.6 sq. m

Metal sheet required = Total surface area of the tank = 31.6 sq. m Cost of constructing it at Rs. 10 per sq. m = 31.6×10 = Rs. 316 Volume of the water the tank can hold = Volume of the tank Volume of the tank = $l \times b \times h = 2.5 \times 2 \times 2.4 = 12$ cu. m Thus, the tank can hold 12 cu. m of water.

Q4.

1. If the weight of jaggery increases, its cost will also increase.

 \therefore This is an example of direct variation.

Given, weight of jaggery = 4 kg

Cost of 4 kg jiggery = Rs. 80

 $\therefore \frac{\text{Weight of jaggery}}{\text{cost}} = \frac{4}{80}$ Given, weight of jaggery = 15 kg Cost of 15 kg = Rs. x. $\therefore \frac{\text{Weight of jaggery}}{\text{cost}} = \frac{15}{x}$

In direct variation, the ratio of the weight of jaggery to the cost remains constant.

$$\therefore \frac{4}{80} = \frac{15}{x} \Longrightarrow 4 \times x = 15 \times 80$$
$$\therefore x = \frac{15 \times 80}{4} = 300$$

Thus, the cost of 15 kg jaggery is Rs. 300.

2. Let John get x litres of milk, then Saurabh gets (x + 2) litres of milk. Total quantity of milk given to them = [x + (x + 2)] litres. According to the given condition, x + (x + 2) = 10 $\Rightarrow 2x + 2 = 10$ $\Rightarrow 2x = 10 - 2 = 8 \Rightarrow x = 4$ And, x + 2 = 4 + 2 = 6

Thus, John got 4 litres of milk and Saurabh got 6 litres of milk.

3.

- i. $\angle ABC$, $\angle BCD$, $\angle CDA$, $\angle DAB$
- ii. The point 'Q' is in the exterior of the quadrilateral.
- iii. Side CD and side AB are the sides adjacent to side AD.
- iv. Point 'P' is in the interior of the quadrilateral.

4.

- i. Part I is a rectangle, whose length = 4.5 1.0 = 3.5 cm and breadth = 1 cm Thus, area of part I = length × breadth = $3.5 \times 1 = 3.5$ sq. cm
- ii. Part II is a square, whose side is 1 cm.
 Thus, area of Part II = (Side)² = (1)² = 1 sq. cm
- iii. Part III is a rectangle, whose length = 6.5 cm and breadth = 1 cm Thus, area of part III = length × breadth = 6.5 × 1 = 6.5 sq. cm
- iv. Part IV is a rectangle, whose length = 6.5 cm and breadth = 4.5 1.0 = 3.5 cm Thus, area of part IV = length × breadth = 6.5 × 3.5 = 22.57 sq. cm

- 5.
- Diagonals of a square are congruent.
 l(QS) = *l*(PR) = 6 cm
- ii. Diagonal of a square bisect each other.
 - \div Point O is the midpoint of segment PR and segment QS.

$$\Rightarrow l(QO) = \frac{1}{2}l(QS) = \frac{1}{2} \times 6 = 3 \text{ cm}$$

- iii. Diagonal of a square bisect each other.
 - \therefore Point O is the midpoint of segment PR and segment QS

$$\Rightarrow l(PO) = \frac{1}{2}l(PR) = \frac{1}{2} \times 6 = 3 \text{ cm}$$

iv. Diagonals of a square are perpendicular bisectors of each other. $\Rightarrow m \angle POS$ = 90°

Q5.

- **1.** From the given graph:
 - i. The number of literate women is the highest in village C.
 - ii. In village B, the number of literate and illiterate women is same.
 - iii. There are 400 illiterate women in village C.
 - iv. In village D,

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Number of literate women = 500
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Number of illiterate women = 700
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Now, 700 – 500 = 200

Thus, in village D, number of illiterate women exceeds the number of literate women by 200.

- v. In village D, the number of literate women is least.
- **2.** From the given figure,
 - i. Vertices P, Q, R, S, T, U, V and W
 - ii. Edges seg PQ, seg OR, seg RS, seg SP, seg TU, seg UV, seg VW, seg WT, seg PW, seg QT, seg RU and seg SV
 - iii. Faces PQRS, TUVW, PQTW, QRUT, RSVU and SPWV
 - iv. Vertex R is common to seg RS, seg RQ and seg RU.
 - v. Vertex W is common to seg WP, seg WT and seg WV.