

# Maharashtra Board

## Class VIII Mathematics

### Board Paper 1

### Solution

Time: 2 hrs

Total Marks: 60

#### SECTION - A

1. Correct Answer: (A)

A quadrilateral with opposite sides parallel is called a parallelogram.

2. Correct Answer: (B)

Area of a rhombus =  $\frac{1}{2} \times$  Product of lengths of diagonals

3. Correct Answer: (D)

Circumference of the circle is  $c = 2\pi r$ .

4. Correct Answer: (D)

The numerical information collected for a specific purpose is called raw data.

5. Correct Answer: (A)

If  $y \propto x$  then  $\frac{y}{x} = k$  (a constant)

6. Correct Answer: (A)

A quadrilateral in which only one pair of opposite sides is parallel is called a trapezium.

7. Correct Answer: (D)

area of a trapezium =  $\frac{1}{2} \times$  Sum of lengths of parallel sides  $\times$  height

8. Correct Answer: (C)

Amount = Principal + Simple interest

9. Correct Answer: (A)

Compound interest = Amount - Principal

10. Correct Answer: (B)

A shopkeeper may sell an article for less than the marked price for some reason. The difference between the marked price and the lowered selling price is called the discount.

11. Correct Answer: (A)

$$\text{Volume of the cylinder} = \pi r^2 h$$

12. Correct Answer: (A)

$$\text{Volume of the sphere} = \frac{4}{3} \pi r^3$$

### SECTION - B

13. The diagonals of a square are congruent.

Therefore, they are of equal length.

$$l(\text{PR}) = l(\text{QR})$$

$$\text{but } l(\text{PR}) = 8 \text{ cm} \quad (\text{Given})$$

$$\text{Therefore, } l(\text{QR}) = 8 \text{ cm}$$

14.  $m\angle\text{POQ} = 40^\circ$  and chord  $\text{PQ} \cong \text{chord RS}$ .

The congruent chords of the circle form congruent angles at the centre.

$$\therefore \angle\text{ROS} \cong \angle\text{POQ}$$

$$\therefore m\angle\text{ROS} \cong m\angle\text{POQ} = 40^\circ$$

The measure of  $\angle\text{ROS}$  is  $40^\circ$ .

15. The area of a triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$

$$\begin{aligned} &= \frac{1}{2} \times 18.2 \times 9 \\ &= 81.9 \text{ cm}^2 \end{aligned}$$

16. The marked price of the carpet is Rs 650. The discount is 8%.

Discount on the marked price

= marked price  $\times$  rate of discount

$$= 650 \times \frac{8}{100}$$

$$= \text{Rs. } 52$$

The selling price = marked price - discount

$$= 650 - 52$$

$$= \text{Rs. } 598$$

The selling price of the carpet is Rs 598.

17. Here,  $r = 5\text{cm}$ ;  $h = 42\text{ cm}$

The volume (V) of a cylinder

$$= \pi r^2 h$$

$$= \frac{22}{7} \times 5 \times 5 \times 42$$

$$= 3300\text{cm}^3$$

The volume of the cylinder is  $3300\text{ cm}^3$ .

18.  $12x^2 + 7x - 10$

$$= \underline{12x^2 + 15x} - \underline{8x - 10}$$

$$= 3x(4x + 5) - 2(4x + 5)$$

$$= (4x + 5)(3x - 2)$$

19.

$$\frac{x+5}{2} = 1 - x$$

$$\therefore x + 5 = 2(1 - x)$$

$$\therefore x + 5 = 2 - 2x$$

$$\therefore x + 2x = 2 - 5$$

$$\therefore 3x = -3$$

$$\therefore x = \frac{-3}{3} = -1$$

20.

	6 1
6	37 21
+ 6	-36
121	121
+ 1	- 121
122	000

Answer: 61

## SECTION - C

21. Line  $k \parallel$  line  $l \parallel$  line  $m$ .

Line  $c$  and line  $d$  are their transversals.

$\therefore$  by the property of three parallel lines and their transversals,

$$\frac{l(XY)}{l(YZ)} = \frac{l(PQ)}{l(QR)}$$

$$\therefore \frac{9}{3} = \frac{6}{l(QR)}$$

$$\therefore 9 \times l(QR) = 6 \times 3$$

$$\therefore l(QR) = \frac{6 \times 3}{9} = 2$$

$$\therefore l(QR) = 2$$

22. The opposite sides of the rectangle are congruent.

$$\therefore \text{seg } PS \cong \text{seg } QR$$

$$\therefore l(PS) = l(QR)$$

$$\therefore l(PS) = 10\text{cm} \quad (\text{Given})$$

$$\therefore l(QR) = 10\text{cm}$$

Similarly,

$$\text{seg } PQ \cong \text{seg } SR$$

$$\therefore l(PQ) = l(SR)$$

$$\therefore l(PQ) = 8\text{cm} \quad (\text{Given})$$

$$\therefore l(SR) = 8\text{cm}$$

**OR**

The sum of the measures of the angles of the quadrilateral is  $360^\circ$ .

$$\therefore m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$$

$$\therefore 90^\circ + 90^\circ + 90^\circ + m\angle D = 360^\circ$$

$$\therefore m\angle D = 90^\circ$$

Now each angle of  $\square ABCD$  is a right angle.

$\therefore \square ABCD$  is a rectangle.

23. To find the length of wire fencing around the circular place, we have to find the circumference of the circular place.

The radius of the circular place = 7.7 m

Circumference =  $2\pi r$

$$= 2 \times \frac{22}{7} \times 7.7$$

$$= 48.4m$$

The length of the wire required for three rounds of fencing

$$= 3 \times \text{circumference}$$

$$= 3 \times 48.4$$

$$= 145.2m$$

The cost is Rs 50 per metre

$\therefore$  the cost of wire 145.2 m in length

$$= 50 \times 145.2$$

$$= \text{Rs. } 7260$$

*The cost of wire = Rs. 7260.*

24.

Number of peas	Tally marks	Frequency
2	<del>    </del>	6
3	<del>    </del>	9
4	<del>    </del>	9
5	<del>    </del>	7
6	<del>    </del>	5
		N=36

**OR**

Number of peas	Tally marks	Frequency
11	<del>    </del>	6
12	<del>    </del> <del>    </del> <del>    </del>	17
13	<del>    </del> <del>    </del>	13
14		4
		N = 40

25. The sale of cloth today (P) = Rs 20,00,000

Increase in the yearly sale (R) = 2%

Period (N) = 3 years

The sale of cloth after 3 years

$$= P \left( 1 + \frac{R}{100} \right)^N$$

$$= 2000000 \left( 1 + \frac{2}{100} \right)^3$$

$$= 2000000 \left( \frac{51}{50} \right)^3$$

$$= \text{Rs. } 2122416$$

The sale of cloth after 3 years = Rs 21,22,416

### SECTION - D

26. Let the numerator of the original fraction be x.

Then its denominator is x + 5.

So the original fraction is  $\frac{x}{x+5}$

If 2 is added to both numerator and denominator, the numerator of the new fraction = x + 2 and the denominator = x + 5 + 2 = x + 7.

From the given condition,  $\frac{x+2}{x+7} = \frac{1}{2}$

$$\therefore 2(x+2) = x+7$$

$$\therefore 2x+4 = x+7$$

$$\therefore 2x-x = 7-4$$

$$\therefore x = 3$$

$$x+5 = 3+5 = 8$$

$\therefore$  The original fraction is  $\frac{3}{8}$ .

**OR**

Let the cost of a pen be Rs x.

Then the cost of a notebook is Rs (x + 5).

The cost of 4 pens at Rs x each = Rs 4x

The cost of 5 notebooks at Rs (x + 5) each = Rs 5(x + 5)

From the given condition,  $4x + 5(x + 5) = 88$

$$4x + 5x + 25 = 88$$

$$9x = 63 \Rightarrow x = 7$$

$$\text{and } x + 5 = 7 + 5 = 12$$

The cost of one pen is Rs 7 and cost of one notebook is Rs 12.

27. For the cylindrical vessel:  $r = 20\text{cm}$ ,  $h = 60\text{ cm}$

Volume of ice-cream in this cylindrical vessel

$$\begin{aligned} &= \pi r^2 h \\ &= \pi \times 20 \times 20 \times 60 \\ &= 24000\pi \text{ cm}^3 \end{aligned}$$

For a cone  $R = 3\text{cm}$ ,  $H = 10\text{ cm}$

Volume of ice-cream in one cone

$$\begin{aligned} &= \frac{1}{3} \pi R^2 H \\ &= \frac{1}{3} \times \pi \times 3 \times 3 \times 10 \\ &= 30\pi \text{ cm}^3 \end{aligned}$$

Number of cones that can be filled with ice-cream

$$\begin{aligned} &= \frac{\text{Volume of ice-cream in this cylindrical vessel}}{\text{Volume of ice-cream in one cone}} \\ &= \frac{24000\pi}{30\pi} \\ &= 800 \end{aligned}$$

800 cones can be filled with ice cream.

28. There is inverse proportion between the number of crates and the number of mangoes.

Let the number of mangoes in each crate be  $x$  and the number of crates be  $y$ .

Then  $x \propto \frac{1}{y}$  (Inverse variation)

$$\therefore x \times y = k \quad (\text{k is a constant})$$

When  $x = 36$ ,  $y = 60$

$$\therefore 36 \times 60 = k$$

$$\therefore k = 2160$$

$$x \times y = k$$

$$\therefore xy = 2160$$

When  $x = 48$

$$48 \times y = 2160$$

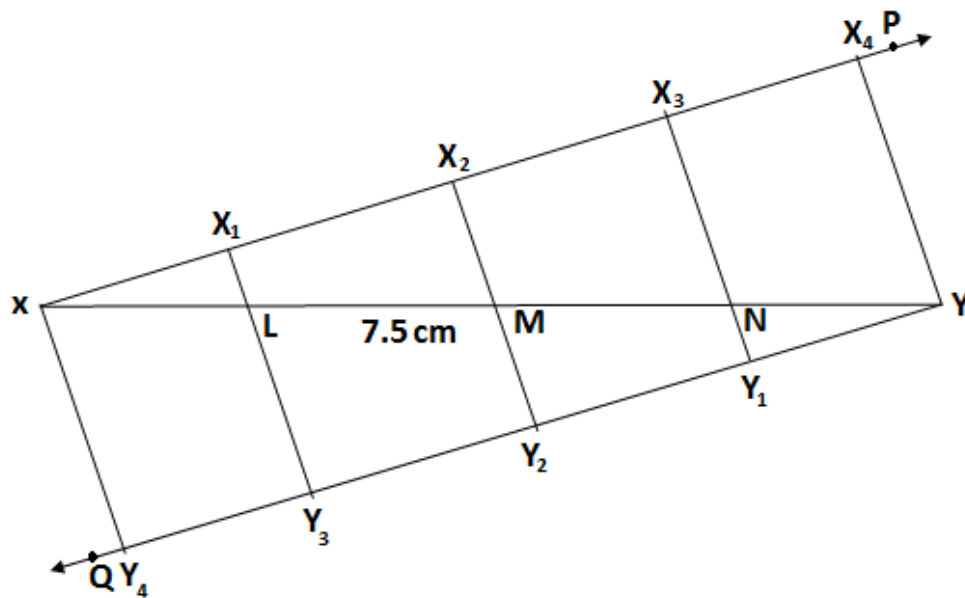
$$\therefore y = 45$$

45 crates are required.

## SECTION - E

### 29. Steps for the construction:

- Draw a segment  $XY$  of length 7.5 cm.
- Draw a ray  $XP$  at point  $X$  on one side of seg  $XY$  making an acute angle with it.
- Draw ray  $YQ$  making an acute angle of the same measure with seg  $XY$ .
- Take any convenient radius and with the tip of your compass at  $X$ , mark a point  $X_1$  on  $XP$ .
- With the compass on  $X_1$  and at the same distance as  $XX_1$ , mark another point  $X_2$ . Similarly, mark two more points  $X_3$  and  $X_4$ .
- Keeping the radius same, mark points  $Y_1, Y_2, Y_3, Y_4$  on ray  $YQ$ .
- Draw the segment  $XY_3, X_1Y_2, X_2Y_1$  and  $X_4Y$  using your ruler. They intersect segment  $XY$  at 3 points. Label them as  $L, M$  and  $N$ .
- The length of segments  $XL, LM, MN$  and  $NY$  is the same.



OR



**Steps for the construction:**

- a) Draw a segment  $XY$  of length 6.5 cm.
- b) Draw a ray  $XP$  at point  $X$  on one side of seg  $XY$  making an acute angle with it.
- c) Draw ray  $YQ$  making an acute angle of the same measure with seg  $XY$ .
- d) Take any convenient radius and with the tip of your compass at  $X$ , mark a point  $X_1$  on  $XP$ .
- e) With the compass on  $X_1$  and at the same distance as  $XX_1$ , mark another point  $X_2$ . Similarly, mark point  $X_3$ .
- f) Keeping the radius same, mark points  $Y_1, Y_2$  and  $Y_3$  on ray  $YQ$ .
- g) Draw the segments  $XY_3, X_1Y_2, X_2Y_1$  and  $X_3Y$  using your ruler. They intersect segment  $XY$  at 2 points. Label them as  $A$  and  $B$ .
- h) The length of segments  $XA, AB$  and  $BY$  is the same.

