

CLASS X – MATHEMATICS

ANSWER KEY

(SET-2)

* SECTION – A (1 × 20 = 20 Marks)

Q1. LCM of 72 and 120

$$= 360 \checkmark \text{ (b)}$$

Q2. $7x + 21 = 0$

$$x = -3 \checkmark \text{ (a)}$$

Q3. $3x - 2y = 5$

$$6x - 4y = 12$$

$$a_1/a_2 = b_1/b_2 \neq c_1/c_2$$

\Rightarrow **No solution** \checkmark (b)

Q4. $a = 2, d = 4$

$$a_{12} = a + 11d$$

$$= 2 + 44$$

$$= 46 \checkmark \text{ (a)}$$

Q5. Numbers > 4 on die = $\{5, 6\}$

$$\text{Probability} = 2/6 = 1/3 \checkmark \text{ (b)}$$

Q6. $\sin 60^\circ = \sqrt{3}/2 \checkmark \text{ (b)}$

Q7. Distance = $\sqrt{[(3+1)^2 + (5-2)^2]}$

$$= \sqrt{(16 + 9)}$$

$$= \sqrt{25} = 5 \checkmark \text{ (a)}$$

Q8. $D = 36 - 36 = 0$

\Rightarrow **Real & Equal** \checkmark (b)

Q9. Area = πr^2

$$= 22/7 \times 441$$

$$= 1386 \text{ cm}^2 \checkmark \text{ (a)}$$

Q10. Mode = 5 ✓ (b)

Q11. Area ratio = $(3/5)^2 = 9/25$ ✓ (c)

Q12. Angle between radius & tangent = 90° ✓ (d)

Q13. Volume of cube = $5^3 = 125$ ✓ (a)

Q14. $\cos \theta = 0$

$\theta = 90^\circ$ ✓ (d)

Q15. Mean of first 8 natural numbers

= $(1+8)/2$

= 4.5 ✓ (b)

Q16. Median = $(9+11)/2$

= 10 ✓ (b)

Q17. $\tan 45^\circ = 1$ ✓ (b)

Q18. Total surface area of sphere = $4\pi r^2$ ✓ (b)

Q19. Both true & R correct explanation ✓ (a)

Q20. Both true but R not explanation ✓ (b)

*** SECTION – B (2 × 5 = 10 Marks)**

Q21. HCF by Euclid's Division Algorithm (2 Marks)

$180 = 144 \times 1 + 36$

$144 = 36 \times 4 + 0$

\therefore HCF = **36**

Q22. 18th Term of AP (2 Marks)

$a = 4, d = 5$

$a_{18} = a + 17d$

= $4 + 85$

= **89**

Q23. Solve $x^2 - 7x + 12 = 0$ (2 Marks)

$$(x-3)(x-4) = 0$$

$$\therefore x = 3, 4$$

Q24. Mean (2 Marks)

$$\text{Mean} = (6+12+18+24+30)/5$$

$$= 90/5$$

$$= \mathbf{18}$$

Q25. Area of Sector (2 Marks)

$$= (90/360) \times \pi \times 14^2$$

$$= 1/4 \times 616$$

$$= \mathbf{154 \text{ cm}^2}$$

*** SECTION – C (3 × 6 = 18 Marks)**

Q26. Solve Linear Equations (3 Marks)

$$2x + 3y = 13$$

$$3x - y = 5$$

Multiply second by 3:

$$9x - 3y = 15$$

Add:

$$11x = 28$$

$$x = 28/11$$

Substitute:

$$3(28/11) - y = 5$$

$$y = 29/11$$

$$\text{Solution} = (28/11, 29/11)$$

Q27. Diagonals of Rectangle are Equal (3 Marks)

In rectangle ABCD,

In $\triangle ABC$ and $\triangle BAD$:

$$AB = AB \text{ (common)}$$

$$BC = AD$$

$$\angle ABC = \angle BAD = 90^\circ$$

By RHS congruency,

$$AC = BD$$

Hence proved.

Q28. Median of Grouped Data (3 Marks)

$$\text{Total } N = 45$$

$$N/2 = 22.5$$

$$\text{Median class} = 20\text{--}30$$

$$l = 20$$

$$f = 15$$

$$cf = 16$$

$$h = 10$$

$$\text{Median} = 20 + [(22.5 - 16)/15] \times 10$$

$$= 20 + 4.33$$

$$= \mathbf{24.33}$$

Q29. Distance from Building (3 Marks)

$$\tan 45^\circ = 50/x$$

$$1 = 50/x$$

$$x = \mathbf{50 \text{ m}}$$

Q30. Sum of 25 Terms (3 Marks)

$$a = 3, d = 4$$

$$S_{25} = 25/2 [2 \times 3 + 24 \times 4]$$

$$= 25/2 (6 + 96)$$

$$= 25/2 \times 102$$

$$= \mathbf{1275}$$

Q31. Curved Surface Area of Cone (3 Marks)

$$\begin{aligned}l &= \sqrt{(r^2 + h^2)} \\ &= \sqrt{(49 + 576)} \\ &= 25\end{aligned}$$

$$\begin{aligned}\text{CSA} &= \pi rl \\ &= 22/7 \times 7 \times 25 \\ &= \mathbf{550 \text{ cm}^2}\end{aligned}$$

* SECTION – D (5 × 4 = 20 Marks)

Q32. Completing Square Method (5 Marks)

$$x^2 - 8x + 15 = 0$$

$$x^2 - 8x = -15$$

Add 16 both sides:

$$(x - 4)^2 = 1$$

$$x - 4 = \pm 1$$

$$x = 5, 3$$

Q33. Basic Proportionality Theorem (5 Marks)

In ΔABC , if $DE \parallel BC$

Then $AD/DB = AE/EC$

Using similar triangles:

$$\Delta ADE \sim \Delta ABC$$

Hence proved.

Q34. Probability (5 Marks)

Total cards = 52

(i) Kings = 4

$$P(\text{King}) = 4/52 = \mathbf{1/13}$$

(ii) Red cards = 26

$$P(\text{Red}) = 26/52 = \mathbf{1/2}$$

Q35. Sphere melted into Cylinders (5 Marks)

$$\begin{aligned}\text{Volume sphere} &= \frac{4}{3} \pi r^3 \\ &= 1437.33 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Volume cylinder} &= \pi r^2 h \\ &= \pi \times 1^2 \times 7 \\ &= 7\pi\end{aligned}$$

$$\begin{aligned}\text{Number} &= 1437.33 / 21.99 \\ &\approx \mathbf{65 \text{ cylinders}}\end{aligned}$$

*** SECTION – E (Case Study)****Q36. Circular Ground**

$$\text{Radius} = 28 \text{ m}$$

$$\begin{aligned}\text{(i) Circumference} &= 2\pi r \\ &= 176 \text{ m}\end{aligned}$$

$$\text{(ii) Area} = 2464 \text{ m}^2$$

$$\begin{aligned}\text{(iii) Cost} &= 176 \times 75 \\ &= ₹13,200\end{aligned}$$

Q38. Ladder Problem

$$\begin{aligned}\text{Height} &= 15 \sin 60^\circ \\ &= 12.99 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Distance} &= 15 \cos 60^\circ \\ &= 7.5 \text{ m}\end{aligned}$$

Verification:

$$\tan 60^\circ = \sqrt{3}$$

$$\sin\theta/\cos\theta = (\sqrt{3}/2)/(1/2) = \sqrt{3} \checkmark \text{ Verified}$$