CLASS X – MATHEMATICS

ANSWER KEY

(SET–7)

✳ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 225 and 375

= **75** ✔ (c)

Q2. $12x - 36 = 0$

$x = 3$ ✔ (b)

Q3.

$2x + 5y = 13$

$4x + 10y = 26$

Second equation is multiple of first

⇒ **Infinitely many solutions** ✔ (c)

Q4. $a = 4$, $d = 3$

$a_{25} = a + 24d$

$= 4 + 72$

= **76** ✔ (b)

Q5. Factors of 6 on die = 1, 2, 3, 6

Probability = 4/6 = **2/3** ✔ (d)

Q6. $\sin 30° = $ **1/2** ✔ (b)

Q7. Distance = $\sqrt{[(3+3)^2 + (-4-4)^2]}$

$= \sqrt{(36 + 64)}$

$= \sqrt{100} = 10$ ✔ (d)

Q8. $x^2 - 8x + 16$

$D = 64 - 64 = 0$

⇒ **Real & equal** ✔ (b)

Q9. Area = πr^2

$= 22/7 \times 196$

= **616 cm²** ✔ (a)

Q10. Mean = (6+12+18+24+30)/5

= 90/5

= **18** ✓ (c)

Q11. Area ratio = $(2/5)^2$ = **4:25** ✓ (b)

Q12. Tangent ⊥ **Radius** ✓ (c)

Q13. Volume = $\pi r^2 h$

= 22/7 × 49 × 21

= **3234 cm^3** ✓ (a)

Q14. cos θ = √3/2

θ = **30°** ✓ (a)

Q15. Median = (9+12)/2

= **10.5** ✓ (b)

Q16. Mode = **5** ✓ (b)

Q17. $\sec^2\theta - \tan^2\theta$ = **1** ✓ (b)

Q18. Surface Area = $6a^2$

= 6 × 81

= **486 cm^2** ✓ (a)

Q19. Both true but R not explanation ✓ (b)

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

✳ SECTION – B (2 × 5 = 10 Marks)

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

867 = 255 × 3 + 102
255 = 102 × 2 + 51
102 = 51 × 2 + 0

∴ HCF = **51**

Q22. 35th Term of AP (2 Marks)

a = 5, d = 5

$a_{35} = a + 34d$

$= 5 + 170$

$= \mathbf{175}$

Q23. Solve $x^2 - 14x + 45 = 0$ (2 Marks)

$(x - 5)(x - 9) = 0$

$\therefore x = 5, 9$

Q24. Mean (2 Marks)

Mean = (7+14+21+28+35)/5

= 105/5

= **21**

Q25. Area of Sector (2 Marks)

$= (120/360) \times \pi \times 14^2$

$= 1/3 \times 616$

$= \mathbf{205.33 \ cm^2}$

✳ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Linear Equations (3 Marks)

$4x - y = 9$
$2x + 3y = 13$

Multiply first by 3:

$12x - 3y = 27$

Add:

$14x = 40$
$x = 20/7$

Substitute:

$4(20/7) - y = 9$
$y = 17/7$

Solution = (20/7 , 17/7)

Q27. Diagonals of Rectangle are Equal (3 Marks)

In rectangle ABCD,

In ΔABC and ΔBAD:
AB = AB (common)
BC = AD
∠ABC = ∠BAD = 90°

By RHS congruency,
AC = BD

Hence proved.

Q28. Median (3 Marks)

Total N = 50
N/2 = 25

Median class = 20–30

l = 20
f = 18
cf = 18
h = 10

Median = 20 + [(25–18)/18] × 10
= 20 + 3.89
= **23.89**

Q29. Horizontal Distance (3 Marks)

tan 45° = 90/x
1 = 90/x

x = **90 m**

Q30. Sum of 45 Terms (3 Marks)

a = 2, d = 4

$S_{45} = 45/2 [4 + 44×4]$
$= 45/2 (4 + 176)$
$= 45/2 × 180$
= 4050

Q31. Curved Surface Area of Cone (3 Marks)

$l = \sqrt{(7^2 + 24^2)}$
$= \sqrt{(49 + 576)}$
$= 25$

$CSA = \pi r l$
$= 22/7 × 7 × 25$
= 550 cm^2

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Quadratic Formula (5 Marks)

$x^2 – 5x – 14 = 0$

$x = [5 ± \sqrt{(25 + 56)}]/2$
$= [5 ± 9]/2$

$x = 7 \text{ or } –2$

Q33. Basic Proportionality Theorem (5 Marks)

If a line parallel to one side divides other two sides proportionally,
Then AD/DB = AE/EC

Hence proved.

Q34. Probability (5 Marks)

Total balls = 18

(i) Red = 7/18

(ii) Not blue = 12/18 = **2/3**

Q35. Sphere into Cubes (5 Marks)

Volume sphere = 4/3 π 21^3
= 38808 cm^3

Volume cube = 27 cm^3

Number = 38808 / 27
= 1437 cubes

✷ SECTION – E (Case Study)

Q36. Circular Garden

Radius = 56 m

(i) Circumference = 2πr
= 352 m

(ii) Area = 9856 m^2

(iii) Cost = 352 × 150
= ₹52,800

Q38. Ladder Problem

Height = 50 sin 60°
= 43.3 m

Distance = 50 cos 60°
= 25 m

Verification:

$1 + \tan^2\theta = \sec^2\theta$ ✓ Verified