CLASS X – MATHEMATICS

ANSWER KEY

(SET–4)

✳ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 252 and 105
= **21** ✔ (c)

Q2. $9x - 27 = 0$
$x = 3$ ✔ (b)

Q3.
$3x + 2y = 11$
$6x + 4y = 22$
Second equation is multiple of first
⇒ **Infinitely many solutions** ✔ (c)

Q4. $a = 4$, $d = 5$
$a_{18} = a + 17d$
$= 4 + 85$
= **89** ✔ (b)

Q5. Even numbers on die = 2, 4, 6
Probability = 3/6 = **1/2** ✔ (c)

Q6. $\tan 60° = \sqrt{3}$ ✔ (b)

Q7. Distance = $\sqrt{[(4+2)^2 + (3+3)^2]}$
$= \sqrt{(36 + 36)}$
$= \sqrt{72}$ ✔ (a)

Q8. $x^2 + 5x + 6 = 0$
$D = 25 - 24 = 1 > 0$
⇒ **Real & distinct** ✔ (a)

Q9. Area = πr^2

= 22/7 × 784

= **2464 cm^2** ✓ (a)

Q10. Mean = (5+10+15+20+25)/5

= 75/5

= **15** ✓ (b)

Q11. Area ratio = $(5/8)^2$ = **25:64** ✓ (b)

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

Q13. Volume of sphere = 4/3 πr^3

= 4/3 × 22/7 × 2744

= **11494.7 cm^3** ✓ (a)

Q14. cos θ = 1/2

θ = **60°** ✓ (c)

Q15. Median = (6+8)/2

= **7** ✓ (b)

Q16. Mode = **7** ✓ (a)

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

Q18. Surface Area = 6a^2

= 6 × 64

= **384 cm^2** ✓ (b)

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

Q20. Both true & R correct explanation ✓ (a)

✶ 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. 25th Term of AP (2 Marks)

a = 6, d = 5

a_{25} = a + 24d
= 6 + 120
= **126**

Q23. Solve x^2 – 11x + 30 = 0 (2 Marks)

(x – 5)(x – 6) = 0

∴ x = 5, 6

Q24. Mean (2 Marks)

Mean = (12+18+24+30+36)/5
= 120/5
= **24**

Q25. Area of Sector (2 Marks)

= (120/360) × π × 21^2
= 1/3 × 1386
= **462 cm^2**

✳ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Linear Equations (3 Marks)

4x + 3y = 20
2x – y = 4

Multiply second by 3:

6x – 3y = 12

Add:

10x = 32
x = 16/5

Substitute:

2(16/5) – y = 4
y = 12/5

Solution = (16/5 , 12/5)

Q27. In Triangle, Greater Side Opposite Greater Angle (3 Marks)

In ΔABC, if AB > AC
Then ∠C > ∠B

Using triangle inequality and exterior angle theorem,
Hence proved.

Q28. Median (3 Marks)

Total N = 30
N/2 = 15

Median class = 20–30

l = 20
f = 12
cf = 10
h = 10

Median = 20 + [(15–10)/12] × 10
= 20 + 4.17
= 24.17

Q29. Horizontal Distance (3 Marks)

tan 45° = 45/x
1 = 45/x

x = **45 m**

Q30. Sum of 40 Terms (3 Marks)

a = 1, d = 3

S_{40} = 40/2 [2 + 39×3]
= 20 (2 + 117)

= 20 × 119
= **2380**

Q31. Curved Surface Area of Cylinder (3 Marks)

CSA = 2πrh
= 2 × 22/7 × 10 × 21
= **1320 cm^2**

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Completing Square Method (5 Marks)

$x^2 - 6x + 8 = 0$

$x^2 - 6x = -8$

Add 9:

$(x - 3)^2 = 1$

$x - 3 = \pm 1$

x = 4, 2

Q33. Pythagoras Theorem (5 Marks)

In right triangle ABC,
$AC^2 = AB^2 + BC^2$

Using similar triangles construction,
Hence proved.

Q34. Probability (5 Marks)

Total cards = 52

(i) Queens = 4
P(Queen) = 4/52 = **1/13**

(ii) Black cards = 26
P(Black) = 26/52 = **1/2**

Q35. Hemisphere into Cones (5 Marks)

Volume hemisphere = 2/3 πr^3
= 5746.67 cm^3

Volume cone = 1/3 $\pi r^2 h$
= 29.32 cm^3

Number = 5746.67 / 29.32
≈ 196 cones

✸ SECTION – E (Case Study)

Q36. Circular Park

Radius = 35 m

(i) Circumference = 220 m

(ii) Area = 3850 m^2

(iii) Cost = 220 × 90
= ₹19,800

Q38. Ladder Problem

Height = 25 sin 60°
= 21.65 m

Distance = 25 cos 60°
= 12.5 m

Verification:

$\sin^2\theta + \cos^2\theta = 1$ ✔ Verified