CLASS X – MATHEMATICS

ANSWER KEY

(SET–3)

✳ SECTION – A (1 × 20 = 20 Marks)

Q1. HCF of 210 and 45 = **15 ✓** (b)

Q2. 6x – 18 = 0

x = 3 **✓** (b)

Q3. 2x + y = 7

4x + 2y = 14

Second is multiple of first

⇒ **Infinitely many solutions ✓** (c)

Q4. a = 5, d = 3

a_{15} = a + 14d

= 5 + 42

= **47 ✓** (b)

Q5. Prime numbers on die = 2,3,5

Probability = 3/6 = **1/2 ✓** (c)

Q6. cos 30° = **√3/2 ✓** (b)

Q7. Distance = $\sqrt{[(5–0)^2 + (12–0)^2]}$

= $\sqrt{(25 + 144)}$

= $\sqrt{169}$ = 13 **✓** (d)

Q8. D = 4 – 4 = 0

⇒ **Real & Equal ✓** (b)

Q9. Area = πr^2

= 22/7 × 49

= **154 cm^2 ✓** (a)

Q10. Mean = (2+4+6+8+10)/5
= 30/5
= **6** ✓ (c)

Q11. Area ratio = $(4/7)^2$ = 16/49 ✓ (c)

Q12. Lengths of tangents from external point are **Equal** ✓ (a)

Q13. Volume = $\pi r^2 h$
= 22/7 × 49 × 10
= **1540 cm^3** ✓ (a)

Q14. sin θ = 0
θ = **0°** ✓ (a)

Q15. Median = **11** ✓ (b)

Q16. Mode = **2** ✓ (b)

Q17. $\sin^2\theta + \cos^2\theta$ = **1** ✓ (b)

Q18. Surface Area = $6a^2$
= 6 × 36
= **216 cm^2** ✓ (a)

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)

657 = 306 × 2 + 45
306 = 45 × 6 + 36
45 = 36 × 1 + 9
36 = 9 × 4 + 0

∴ HCF = **9**

Q22. 20th Term of AP (2 Marks)

a = 3, d = 3

$a_{20} = a + 19d$
$= 3 + 57$
$= \mathbf{60}$

Q23. Solve $x^2 – 9x + 14 = 0$ (2 Marks)

$(x – 7)(x – 2) = 0$

$\therefore x = 7, 2$

Q24. Mean (2 Marks)

Mean = (10+20+30+40+50)/5
= 150/5
= **30**

Q25. Area of Sector (2 Marks)

$= (60/360) \times \pi \times 14^2$
$= 1/6 \times 616$
$= \mathbf{102.67\ cm^2}$

✳ SECTION – C (3 × 6 = 18 Marks)

Q26. Solve Linear Equations (3 Marks)

$x + 2y = 5$
$3x – y = 5$

Multiply first by 1:

$x = 5 – 2y$

Substitute:

$3(5 – 2y) – y = 5$
$15 – 6y – y = 5$
$15 – 7y = 5$
$7y = 10$
$y = 10/7$

x = 5 – 20/7
= 15/7

Solution = (15/7 , 10/7)

Q27. Diagonals of Parallelogram Bisect Each Other (3 Marks)

In parallelogram ABCD,
Diagonals AC and BD intersect at O.

In ΔAOB and ΔCOD:

AB = CD
∠AOB = ∠COD (vertical angles)
∠ABO = ∠CDO

By ASA congruency,
AO = OC and BO = OD

Hence proved.

Q28. Median (3 Marks)

Total N = 30
N/2 = 15

Median class = 20–30

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

Median = 20 + [(15–10)/10] × 10
= 20 + 5
= **25**

Q29. Horizontal Distance (3 Marks)

tan 30° = 60/x

$1/\sqrt{3} = 60/x$

$x = 60\sqrt{3}$
= **103.92 m**

Q30. Sum of 30 Terms (3 Marks)

a = 2, d = 3

S_{30} = 30/2 [2×2 + 29×3]
= 15 (4 + 87)
= 15 × 91
= **1365**

Q31. Surface Area of Sphere (3 Marks)

= $4\pi r^2$
= 4 × 22/7 × 196
= **2464 cm^2**

✳ SECTION – D (5 × 4 = 20 Marks)

Q32. Quadratic Formula (5 Marks)

$3x^2 – 5x – 2 = 0$

x = [5 ± √(25 + 24)] / 6
= [5 ± 7] / 6

x = 2 or –1/3

Q33. Basic Proportionality Theorem (5 Marks)

If a line parallel to one side of triangle divides other two sides proportionally,

Then AD/DB = AE/EC

Using similarity of triangles, theorem proved.

Q34. Probability (5 Marks)

Total balls = 15

(i) Green = 6/15 = **2/5**

(ii) Not red = 11/15

Q35. Cone into Spheres (5 Marks)

Volume cone = 1232 cm^3

Volume sphere (r=2)
= 4/3 π 8
= 33.51 cm^3

Number = 1232 / 33.51
≈ 37 spheres

✳ SECTION – E (Case Study)

Q36. Circular Garden

Radius = 35 m

(i) Circumference = 2πr
= 220 m

(ii) Area = 3850 m^2

(iii) Cost = 220 × 80
= ₹17,600

Q38. Ladder Problem

Height = 20 sin 30°
= 10 m

Distance = 20 cos 30°
= 17.32 m

Verification:

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