# CLASS X – MATHEMATICS

# ANSWER KEY

# (SET–8)

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## ✳ SECTION – A (1 × 20 = 20 Marks)

**Q1.** HCF of 315 and 189
= **63** ✓ (d)

**Q2.** $15x - 45 = 0$
$x = 3$ ✓ (b)

**Q3.**
$3x + 4y = 10$
$6x + 8y = 20$
Second equation is multiple of first
⇒ **Infinitely many solutions** ✓ (c)

**Q4.** $a = 2$, $d = 3$
$a_{30} = a + 29d$
$= 2 + 87$
= **89** ✓ (b)

**Q5.** Numbers < 3 on die = {1,2}
Probability = 2/6 = **1/3** ✓ (b)

**Q6.** $\tan 45° = $ **1** ✓ (a)

**Q7.** Distance $= \sqrt{[(4-1)^2 + (5-1)^2]}$
$= \sqrt{(9 + 16)}$
$= \sqrt{25} = $ **5** ✓ (a)

**Q8.** $x^2 + 7x + 10 = 0$
$D = 49 - 40 = 9 > 0$
⇒ **Real & distinct** ✓ (a)

**Q9.** Area = $\pi r^2$

= 22/7 × 441

= **1386 cm$^2$** ✓ (a)

**Q10.** Mean = (5+15+25+35+45)/5

= 125/5

= **25** ✓ (b)

**Q11.** Area ratio = $(3/4)^2$ = **9:16** ✓ (b)

**Q12.** Tangent ⊥ **Radius** ✓ (c)

**Q13.** Volume = 4/3 $\pi r^3$

= 4/3 × 22/7 × 343

= **1437.33 cm$^3$** ✓ (a)

**Q14.** sin θ = $\sqrt{3}/2$

θ = **60°** ✓ (c)

**Q15.** Median = (10+14)/2

= **12** ✓ (b)

**Q16.** Mode = **8** ✓ (a)

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

**Q18.** Surface Area = $6a^2$

= 6 × 49

= **294 cm$^2$** ✓ (a)

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

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

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# ✳ SECTION – B (2 × 5 = 10 Marks)

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

306 = 153 × 2 + 0

∴ HCF = **153**

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### Q22. 40th Term of AP (2 Marks)

a = 3, d = 4

$a_{40} = a + 39d$
$= 3 + 156$
= **159**

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## Q23. Solve $x^2 – 9x + 20 = 0$ (2 Marks)

$(x – 4)(x – 5) = 0$

$\therefore x = 4, 5$

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## Q24. Mean (2 Marks)

Mean = (9+18+27+36+45)/5
= 135/5
= **27**

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## Q25. Area of Sector (2 Marks)

$= (60/360) \times \pi \times 28^2$
$= 1/6 \times 2464$
$= \textbf{410.67 cm}^2$

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# ✳ SECTION – C (3 × 6 = 18 Marks)

### Q26. Solve Linear Equations (3 Marks)

$2x + 3y = 11$
$4x – y = 5$

Multiply second by 3:

$12x – 3y = 15$

Add:

$14x = 26$
$x = 13/7$

Substitute:

$4(13/7) – y = 5$
$y = 17/7$

Solution = (13/7 , 17/7)

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

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

Using triangle congruency:
AO = OC and BO = OD

Hence proved.

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**Q28. Median (3 Marks)**

Total N = 40
N/2 = 20

Median class = 20–30

l = 20
f = 15
cf = 15
h = 10

Median = 20 + [(20–15)/15] × 10
= 20 + 3.33
**= 23.33**

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**Q29. Horizontal Distance (3 Marks)**

tan 45° = 100/x
1 = 100/x

x = **100 m**

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**Q30. Sum of 60 Terms (3 Marks)**

a = 1, d = 4

$S_{60}$ = 60/2 [2 + 59×4]
= 30 (2 + 236)
= 30 × 238
**= 7140**

## Q31. Curved Surface Area of Cylinder (3 Marks)

CSA = 2πrh
= 2 × 22/7 × 7 × 30
= **1320 cm$^2$**

# ✳ SECTION – D (5 × 4 = 20 Marks)

## Q32. Completing Square Method (5 Marks)

$x^2$ – 7x + 10 = 0

$x^2$ – 7x = –10

Add $(7/2)^2$ = 49/4

$(x – 7/2)^2$ = 9/4

x – 7/2 = ±3/2

x = 5 or 2

## Q33. Pythagoras Theorem (5 Marks)

In right triangle,
Hypotenuse$^2$ = Base$^2$ + Perpendicular$^2$

Hence proved.

## Q34. Probability (5 Marks)

Total cards = 52

(i) Kings = 4
P(King) = **1/13**

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

## Q35. Cone into Spheres (5 Marks)

Volume cone = 1/3 π 21$^2$ 28
= 12936 cm$^3$

Volume sphere (r=3)
= 113.1 cm$^3$

Number = 12936 / 113.1
≈ **114 spheres**

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# ✳ SECTION – E (Case Study)

**Q36. Circular Park**

Radius = 63 m

(i) Circumference = 2πr
= **396 m**

(ii) Area = πr$^2$
= **12474 m$^2$**

(iii) Cost = 396 × 200
= **₹79,200**

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**Q38. Ladder Problem**

Height = 60 sin 30°
= **30 m**

Distance = 60 cos 30°
= **51.96 m**

Verification:

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

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