ANSWER KEY

PARABOLA

EXERCISE–I

2. (a, 0) ; a

3. $2x - y + 2 = 0$, (1, 4) ; $x + 2y + 16 = 0$, (16, –16)

5. $3x - 2y + 4 = 0$; $x - y + 3 = 0$

6. (4 , 0) ; $y^2 = 2a(x - 4a)$

8. $y = -4x + 72$, $y = 3x - 33$

9. $7y \pm 2(x + 6a) = 0$

14. $x^2 + y^2 + 18x - 28y + 27 = 0$

16. $x - y = 1$; $8\sqrt{2}$ sq. units

17. $15a^2/4$

20. $a^2 > 8b^2$

EXERCISE–II

3. $[a(t_0^2 + 4), -2at_0]$

5. $(ax + by)(x^2 + y^2) + (bx - ay)^2 = 0$

10. $((x_1 - 2a), 2y_1)$

12. Q(4, –8)

14. $(x^2 + y^2 - 4ax)^2 = 16a(x^3 + xy^2 + ay^2)$

16 $y^2 = 8ax$

EXERCISE–III

1. $x - 2y + 1 = 0$; $y = mx + \frac{1}{4m}$ where $m = \frac{-5 \pm \sqrt{30}}{10}$

2. (a) C ; **(b)** B

3. $(x + 3)y^2 + 32 = 0$

4. **(a)** C ; **(b)** D

5. C

6. D

7. **(a)** C ; **(b)** $\alpha = 2$

8. B

9. $2(y - 1)^2(x - 2) = (3x - 4)^2$

10. **(a)** D, **(b)** A, B, **(c)** (i) A, (ii) B, (iii) D, (iv) C

11. A

12. **(a)** C; **(b)** B; **(c)** D

13. B, C

14. A, D

15. C, D

16. C

17. ABD

18. 2

19. 4

20. C

21. D

22. B

23. A

24. B

25. D

26. D

27. B

28. A

29. A, D

30. 4

31. 2

32. A

33. A, B, C

34. A,C,D

35. D

36. C

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ELLIPSE

EXERCISE–I

1. (a) $20x^2 + 45y^2 - 40x - 180y - 700 = 0$; (b) $3x^2 + 5y^2 = 32$

8. $x + y - 5 = 0$, $x + y + 5 = 0$

9. $\theta = \frac{\pi}{3}$ or $\frac{5\pi}{3}$; $4x \pm \sqrt{33}y - 32 = 0$

10. 24 sq.units

11. $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$

14. $55\sqrt{2}$ sq. units

16. $\frac{18a}{17}$

20. 85

EXERCISE–II

1. $(a^2 - b^2)^2 x^2y^2 = a^2(a^2 + b^2)^2 y^2 + 4b^6x^2$

4. 186

5. $bx + a\sqrt{3}y = 2ab$

8. 80

9. (b) 8/3, (c) 4

12. $\sqrt{r^2 - b^2}$

13. $12x + 5y = 48$; $12x - 5y = 48$

15. 19

EXERCISE–III

1. (a) A ; (b) B, D ; (c) $25y^2 + 4x^2 = 4x^2y^2$ 2. $(x-1)^2 + y^2 = \frac{11}{3}$

4. Locus is an ellipse with foci as the centres of the circles C_1 a nd C_2.

5. $a^2p^2 + b^2q^2 = r^2\sec^2\frac{\pi}{8} = (4-2\sqrt{2})r^2$ 7. (a) C ; (b) A 8. C

9. (a) A, (b) $AB = \frac{14}{\sqrt{3}}$ 10. D 11. C 12. D 13. C 14. A

15. C 16. B 17. 9 18. D 19. A 20. A 21. A, B
22. 4 23. A 24. C 25. D 26. A, C

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HYPERBOLA

EXERCISE–I

1. $7x^2 + 12xy - 2y^2 - 2x + 4y - 7 = 0$; $\sqrt{\frac{48}{5}}$ 2. $a^2 = 25/2$; $b^2 = 16$

4. $(-1, 2)$; $(4, 2)$ & $(-6, 2)$; $5x - 4 = 0$ & $5x + 14 = 0$; $\frac{32}{3}$; 6 ; 8 ; $y - 2 = 0$;
$x + 1 = 0$; $4x - 3y + 10 = 0$; $4x + 3y - 2 = 0$.

5. $x + y \pm 3\sqrt{3} = 0$ 6. $3x + 2y - 5 = 0$; $3x - 2y + 5 = 0$ 11. $\frac{(x-\frac{1}{3})^2}{1/9} + \frac{(y-1)^2}{1/12} = 1$

13. $(x^2 + y^2)^2 (a^2y^2 - b^2x^2) = x^2y^2 (a^2 + b^2)^2$ 17. $\frac{x^2}{a^4} + \frac{y^2}{b^4} = \frac{1}{a^2+b^2}$

20. $\frac{x^2}{49} + \frac{y^2}{36} = 1$; $\frac{x^2}{9} - \frac{y^2}{4} = 1$

EXERCISE–II

2. 40 3. $y = \frac{5}{12}x + \frac{3}{4}$; $x - 3 = 0$; 8 sq. unit

7. (15, 10) and (3, – 2) and 30 sq. units 8. $(-4, 3)$ & $\left(-\frac{4}{7}, -\frac{3}{7}\right)$ 9. $\frac{150}{\sqrt{481}}$

10. $4\left(\frac{x^2}{a^2} - \frac{y^2}{b^2}\right) = 3$ 13. ab 20. $xy = \frac{8}{9}c^2$

EXERCISE–III

1. (a) A ; (b) D ; (c) B 2. D 3. A 4. A

5. $\frac{x^2}{9} - \frac{y^2}{4} = \left(\frac{x^2+y^2}{9}\right)^2$ 6. A, C 7. (a) A, (b) C, (c) C

8. (a) A; (b) (A) P, Q; (B) P ,Q; (C) Q, R; (D) Q, R

9. (a) B; (b) B 10. (A) → P ; (B) → S, T ; (C) → R ; (D) → Q, S 11. A, B
12. B 13. A 14. 2 15. B 16. B, D 17. A, B
18. A, B, D 19. D 20. C 21. D 22. ABD
23. C 24. A 25. B 26. B 27. B