

3. $\frac{n}{6}(n+1)(3n^2+5n+1)$ 4. $\frac{n}{n+1}$ 5. 2840
 6. $3n(n+1)(n+3)$ 7. $\frac{n(n+1)^2(n+2)}{12}$
 8. $\frac{n(n+1)}{12}(3n^2+23n+34)$
 9. $\frac{n}{6}(n+1)(2n+1)+2(2^n-1)$ 10. $\frac{n}{3}(2n+1)(2n-1)$

Miscellaneous Exercise on Chapter 9

2. 5, 8, 11 4. 8729 5. 3050 6. 1210
 7. 4 8. 160; 6 9. ± 3 10. 8, 16, 32
 11. 4 12. 11
 21. (i) $\frac{50}{81}(10^n-1)-\frac{5n}{9}$, (ii) $\frac{2n}{3}-\frac{2}{27}(1-10^{-n})$ 22. 1680
 23. $\frac{n}{3}(n^2+3n+5)$ 25. $\frac{n}{24}(2n^2+9n+13)$
 27. Rs 16680 28. Rs 39100 29. Rs 43690 30. Rs 17000; 20,000
 31. Rs 5120 32. 25 days

EXERCISE 10.1

1. $\frac{121}{2}$ square unit.
 2. $(0, a)$, $(0, -a)$ and $(-\sqrt{3}a, 0)$ or $(0, a)$, $(0, -a)$, and $(\sqrt{3}a, 0)$
 3. (i) $|y_2 - y_1|$, (ii) $|x_2 - x_1|$ 4. $(\frac{15}{2}, 0)$ 5. $-\frac{1}{2}$
 7. $-\sqrt{3}$ 8. $x = 1$ 10. 135°
 11. 1 and 2, or $\frac{1}{2}$ and 1, or -1 and -2 , or $-\frac{1}{2}$ and -1 14. $\frac{1}{2}$, 104.5 Crores

EXERCISE 10.2

1. $y = 0$ and $x = 0$ 2. $x - 2y + 10 = 0$ 3. $y = mx$
 4. $(\sqrt{3} + 1)x - (\sqrt{3} - 1)y = 4(\sqrt{3} - 1)$ 5. $2x + y + 6 = 0$
 6. $x - \sqrt{3}y + 2\sqrt{3} = 0$ 7. $5x + 3y + 2 = 0$
 8. $\sqrt{3}x + y = 10$ 9. $3x - 4y + 8 = 0$ 10. $5x - y + 20 = 0$
 11. $(1 + n)x + 3(1 + n)y = n + 11$ 12. $x + y = 5$
 13. $x + 2y - 6 = 0, 2x + y - 6 = 0$
 14. $\sqrt{3}x + y - 2 = 0$ and $\sqrt{3}x + y + 2 = 0$ 15. $2x - 9y + 85 = 0$
 16. $L = \frac{.192}{90}(C - 20) + 124.942$ 17. 1340 litres. 19. $2kx + hy = 3kh$.

EXERCISE 10.3

1. (i) $y = -\frac{1}{7}x + 0, -\frac{1}{7}, 0$; (ii) $y = -2x + \frac{5}{3}, -2, \frac{5}{3}$; (iii) $y = 0x + 0, 0, 0$
 2. (i) $\frac{x}{4} + \frac{y}{6} = 1, 4, 6$; (ii) $\frac{x}{3} + \frac{y}{-2} = 1, \frac{3}{2}, -2$;
 (iii) $y = -\frac{2}{3}$, intercept with y -axis = $-\frac{2}{3}$ and no intercept with x -axis.
 3. (i) $x \cos 120^\circ + y \sin 120^\circ = 4, 4, 120^\circ$ (ii) $x \cos 90^\circ + y \sin 90^\circ = 2, 2, 90^\circ$;
 (iii) $x \cos 315^\circ + y \sin 315^\circ = 2\sqrt{2}, 2\sqrt{2}, 315^\circ$ 4. 5 units
 5. $(-2, 0)$ and $(8, 0)$ 6. (i) $\frac{65}{17}$ units, (ii) $\frac{1}{\sqrt{2}} \left| \frac{p+r}{l} \right|$ units.
 7. $3x - 4y + 18 = 0$ 8. $y + 7x = 21$ 9. 30° and 150°
 10. $\frac{22}{9}$
 12. $(\sqrt{3} + 2)x + (2\sqrt{3} - 1)y = 8\sqrt{3} + 1$ or $(\sqrt{3} - 2)x + (1 + 2\sqrt{3})y = -1 + 8\sqrt{3}$

13. $2x + y = 5$ 14. $\left(\frac{68}{25}, -\frac{49}{25}\right)$ 15. $m = \frac{1}{2}, c = \frac{5}{2}$
 17. $y - x = 1, \sqrt{2}$

Miscellaneous Exercise on Chapter 10

1. (a) 3, (b) ± 2 , (c) 6 or 1 2. $\frac{7\pi}{6}, 1$
 3. $2x - 3y = 6, -3x + 2y = 6$ 4. $\left(0, -\frac{8}{3}\right), \left(0, \frac{32}{3}\right)$
 5. $\left|\cos\left(\frac{\phi - \theta}{2}\right)\right|$ 6. $x = -\frac{5}{22}$ 7. $2x - 3y + 18 = 0$
 8. k^2 square units 9. 5 11. $3x - y = 7, x + 3y = 9$
 12. $13x + 13y = 6$ 14. 1 : 2 15. $\frac{23\sqrt{5}}{18}$ units
 16. The line is parallel to x - axis or parallel to y -axis
 17. $x = 1, y = 1.$ 18. $(-1, -4).$ 19. $\frac{1 \pm 5\sqrt{2}}{7}$
 21. $18x + 12y + 11 = 0$ 22. $\left(\frac{13}{5}, 0\right)$ 24. $119x + 102y = 125$

EXERCISE 11.1

1. $x^2 + y^2 - 4y = 0$ 2. $x^2 + y^2 + 4x - 6y - 3 = 0$
 3. $36x^2 + 36y^2 - 36x - 18y + 11 = 0$ 4. $x^2 + y^2 - 2x - 2y = 0$
 5. $x^2 + y^2 + 2ax + 2by + 2b^2 = 0$ 6. $c(-5, 3), r = 6$
 7. $c(2, 4), r = \sqrt{65}$ 8. $c(4, -5), r = \sqrt{53}$ 9. $c\left(\frac{1}{4}, 0\right); r = \frac{1}{4}$
 10. $x^2 + y^2 - 6x - 8y + 15 = 0$ 11. $x^2 + y^2 - 7x + 5y - 14 = 0$
 12. $x^2 + y^2 + 4x - 21 = 0$ & $x^2 + y^2 - 12x + 11 = 0$