



Exercise 6B

1. (a) $a^{1/2}$ (b) 2 2. $p+q$
 3. $\sqrt{3}-\sqrt{2}$ 4. $\frac{\sqrt{3}+1}{2}$
 5. (a) $\frac{1}{4}$ (b) x^4y^6 6. $4\sqrt{3}$
 7. (a) $\frac{a^7}{b^5}$ (b) $\frac{2x+y}{2}$
 8. (a) $-\frac{3}{2}$ (b) 3

Exercise 6C

1. $x = \frac{3}{2}, y = \frac{1}{2}$ 2. 2
 3. (a) -1 (b) ■
 4. (a) 3^{4+1} (b) 4 5. 0
 6. (a) $r+2s$ (b) $1-r+s$

Exercise 7A

1. (a) (ii) (b) (iii) (c) (i)
 2. (a) $a > 0, b > 0$ (b) $a < 0, b < 0$
 (c) $a < 0, b = 0$
 3. (a) $q < 0, r > 0$ (b) $p > 0, r = 0$
 (c) $p > 0, q > 0$
 4. (a) (iii) (b) (i) (c) (ii)
 5. (a) $a > 0, c > 0, \Delta > 0$ (b) $a < 0, c = 0, \Delta > 0$
 (c) $a < 0, b < 0, c > 0$ (d) $a > 0, b < 0, c > 0$
 6. $x+1, y = 1$
 7. (a) $x = 0.4, y = 2.4$ (b) $x = -1.3, y = 0.7$
 (c) $x = 3, y = -1.5$
 8. (a) $x = -3, y = 7; x = 2, y = 2$
 (b) $x = 1, y = -1$
 9. (a) $x = 0.5, y = 1.8, x = 3, y = 3$
 (b) $x = 0, y = 0, x = 4.5, y = -2.3$
 10. $y = -3x+4$ 11. $y = 2x+24$ 12. $y = 7$
 13. $y = 6x-4$ 14. $y = -3x+\frac{3}{2}$ 15. $y = 8$
 16. $y = -x-1$ 17. $y = 4x$ 18. $y = \frac{4}{3}$
 19. $y = \frac{3}{2}x+\frac{1}{2}$ 20. $y = -2$ 21. $y = x$
 22. $y = 5$ 23. $y = \frac{9}{2}$ 24. $y = -\frac{1}{2}x+\frac{9}{2}$

25. (a) -1.8, 2.8 (b) -2.7, 0.7
 26. (a) -1.8, 3.8 (b) -0.9, 2.4
 27. (a) $y = (x-3)^2 - 4$ (b) -4
 28. (a) $x = (y+6)^2 - 29$ (b) -29
 29. (a) $y = 2(x+2)^2 + 1$ (b) 1
 30. (a) $y = 3\left(x+\frac{1}{6}\right)^2 + 5\frac{11}{12}$ (b) $5\frac{11}{12}$
 31. (a) $y = -(x-1)^2 - 2$ (b) -2
 32. (a) $y = -\left(x-\frac{5}{2}\right)^2 + 10\frac{1}{4}$ (b) $10\frac{1}{4}$
 33. (a) $y = 2\left(x-\frac{3}{2}\right)^2 + 5\frac{1}{2}$ (b) $5\frac{1}{2}$
 34. (a) $y = -3\left(x+\frac{1}{3}\right)^2 - \frac{2}{3}$ (b) $-\frac{2}{3}$
 35. (-2, -1) 30. (2, 1) 37. 500 m
 38. -4, 4 39. (0, -4) 40. 54 sq. units
 41. (a) $b = 2, c = -8$ (b) -4
 42. $a = 2, b = -2, c = -12$ 43. $p = 7, q = -10$
 44. (a) -b (b) c 45. $\pm\frac{5}{2}$
 46. (a) -2 (b) -6 (c) -2 (d) 16
 47. P(6, 0), Q(5, -5), R(1, -5)
 48. (a) -9 (b) (4, -1) 49. (a) -5 (b) (-3, 6)

Exercise 7B

1. (a) $\alpha + \beta = -p, p = 4$ (b) -5
 2. (a) A = (0.5), B = (1, 0), C = (5, 0)
 (b) D = (7, 12)
 3. (a) $c = 6, \alpha\beta = 6$ (b) -b
 (c) $(\alpha - \beta)^2 = b^2 - 24$ area = $3\sqrt{b^2 - 24}$
 4. (a) (i) 3 (ii) $-k-4$ (b) 14

Exercise 7C

1. (a) (i) 10 (ii) k
 (b) (i) 5 (ii) $\frac{k}{4}$
 (c) (i) $p = -5, 5 = \frac{k}{4}$ (ii) 24
 2. (a) ■
 (b) (i) 4 (ii) 2.6, 5.4
 (c) (i) ■ (ii) 0.6, 3.4
 3. (a) $a = -1, b = 1, c = 6$
 (b) (i) -1.8, 2.8 (ii) -0.4, 2.4

Functions →

1. (a) 0 (b) 4 (c) 0
2. (a) (i) $\frac{1}{2}$ (ii) $-\frac{2}{3}$ (b) 2
3. (a) $\frac{1}{2}$ (b) 1 (c) $\frac{1}{4}$
4. (a) -1 (b) 0.5 (c) $\sqrt{2}$
5. (a) 60.5 (b) $90 + \frac{\sqrt{2}}{2}$ (c) $61 - \frac{\sqrt{3}}{3}$
6. -1
7. (a) 1 (b) 30 (c) $\frac{9}{5}$ (d) $\frac{13}{35}$
8. (a) 18 (b) 0 (c) 110
9. (a) 1 (b) 9 (c) 10 (d) 3

(a)
(b)
(a)
(b)
(a)
(b)

Graphs →

P.3

1. (a) (ii) (b) (iii) (c) (i)
2. (a) $a > 0, b > 0$ (b) $a < 0, b < 0$
(c) $a < 0, b = 0$
3. (a) $q < 0, r > 0$ (b) $p > 0, r = 0$
(c) $p > 0, q > 0$
4. (a) (iii) (b) (i) (c) (ii)
5. (a) $a > 0, c > 0, \Delta > 0$ (b) $a < 0, c = 0, \Delta \geq 0$
(c) $a < 0, b \neq 0, c > 0$ (d) $a > 0, b < 0, c > 0$
6. $x + 1, y = 1$
7. (a) $x = 0.4, y = 2.4$ (b) $x = -1.3, y = 0.7$
(c) $x = 3, y = -1.5$
8. (a) $x = -3, y = 7; x = 2, y = 2$
(b) $x = 1, y = -1$
9. (a) $x = 0.5, y = 1.8, x = 3, y = 3$
(b) $x = 0, y = 0, x = 4.5, y = -2.3$
10. $y = -3x + 4$ 11. $y = 2x + 24$ 12. $y = 7$
13. $y = 6x - 4$ 14. $y = -3x + \frac{3}{2}$ 15. $y = 8$
16. $y = -x - 1$ 17. $y = 4x$ 18. $y = \frac{4}{3}$
19. $y = \frac{3}{2}x + \frac{1}{2}$ 20. $y = -2$ 21. $y = x$
22. $y = 5$ 23. $y = \frac{9}{2}$ 24. $y = -\frac{1}{2}x + \frac{9}{2}$

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25. (a) -1.8, 2.8 (b) -2.7, 0.7
26. (a) -1.8, 3.8 (b) -0.9, 2.4
27. (a) $y = (x - 3)^2 - 4$ (b) -4
28. (a) $x = (y + 6)^2 - 29$ (b) -29
29. (a) $y = 2(x + 2)^2 + 1$ (b) 1
30. (a) $y = 3\left(x + \frac{1}{6}\right)^2 + 5\frac{11}{12}$ (b) $5\frac{11}{12}$
31. (a) $y = -(x - 1)^2 - 2$ (b) -2
32. (a) $y = -\left(x - \frac{5}{2}\right)^2 + 10\frac{1}{4}$ (b) $10\frac{1}{4}$
33. (a) $y = 2\left(x - \frac{3}{2}\right)^2 + 5\frac{1}{2}$ (b) $5\frac{1}{2}$
34. (a) $y = -3\left(x + \frac{1}{3}\right)^2 - \frac{2}{3}$ (b) $-\frac{2}{3}$
35. (-2, -1) 36. (2, 1) 37. 500 m
38. -4, 4 39. (0, -4) 40. 54 sq. units
41. (a) $b = 2, c = -8$ (b) -4
42. $a = 2, b = -2, c = -12$ 43. $p = 7, q = -10$
44. (a) -b (b) c 45. $\pm\frac{5}{2}$
46. (a) -2 (b) -6 (c) -2 (d) 16
47. P(6, 0), Q(5, -5), R(1, -5)
48. (a) -9 (b) (4, -1) 49. (a) -5 (b) (-3, 6)

5. (a) $-n, n - 2m$
 (b) $m = -4, n = -3$ or $m = -4, n = -5$
6. (a) 29, two real roots
 (b) -8, no real roots
7. (a) $d < 16$ (b) $d = \frac{11}{6}$ (c) $d > \frac{3}{2}$
8. (a) $k = \frac{49}{4}$ (b) $k < -\frac{169}{4}$
9. (a) $k = -7$ or 1 (b) $x = -\frac{1}{2}$
10. $k = 4$ or $\frac{16}{5}$ 11. $p = 12, q = 36$
14. The other root = $-\frac{2}{3}, k = -6$
15. $k = -5$ or 5
16. (a) $\frac{6}{5}$ (b) $\frac{8}{11}$ (c) $\frac{3}{2}$
 (d) 3 (e) $\frac{3}{2}$
17. (a) $\frac{124}{9}$ (b) $-\frac{275}{9}$
18. (a) $\frac{15}{2}$ (b) 9
19. $k = 5, x = 2$ or 4 20. 2, 3
21. (a) sum of roots = $2p$
 product of roots = p^2
 (b) (i) $x = -2$ or $x = 2$
 (ii) $a = -\frac{1}{2}, b = 2, c = -2$
 or $a = \frac{1}{2}, b = 2, c = 2$
22. (a) $x^2 + 4x + 3$ (b) $4x^2 - 2x - 3 = 0$
23. (a) $2x^2 - 5x + 8 = 0$
 (b) $16x^2 - 38x + 25 = 0$
24. $x^2 + 8 = 0$ 25. $x^2 + 5x - 3 = 0$
26. $x^2 - 4x - 1 = 0$ 27. $4x^2 + 7x + 16 = 0$
28. $4x^2 - 225x + 25 = 0$
29. (a) $2, \frac{20}{3}$ (b) $-\frac{2}{9}, 4$
30. (a) $-1, 2, -2, 3$ (b) $-3, \frac{1}{2}$
31. (a) $-\frac{1}{3}, 3, -\frac{1}{4}, 4$ (b) $0, -6, \frac{-6 \pm 3\sqrt{2}}{2}$

32. 2 33. 20 m
34. $2x^2 + 13x - 15 = 0, x = 1$
35. 240 km/h 36. $x = 7, y = 5, z = 3$
37. $\frac{1 + \sqrt{5}}{2}$
38. (b) $7x^2 - 11x - 6 = 0, 2$

P.Y.
 Answers On Quadratic Equations
 EXERCISE 3A (P.97)

1. -4 (min), $x = -2$ 2. -8 (min), $x = -3$
3. -4 (min), $x = 1$ 4. -1 (min), $x = 1$
5. -25 (min), $x = 5$ 6. 1 (max), $x = 1$
7. 12 (max), $x = 2$ 8. $-\frac{7}{8}$ (max), $x = \frac{3}{4}$
9. $\frac{89}{8}$ (max), $x = \frac{1}{8}$ 10. $\frac{1}{8}$ (max), $x = \frac{15}{4}$
11. 3, -3 12. 5, 5 13. 2 000 m
14. 30 15. 2 m^2
16. 1 800 m^2 , 30 m \times 60 m
17. 20 000 m^2 , 100 m \times 200 m
18. (a) $a = 2, b = 4$ (b) 5
19. (a) $a = -1, c = 8$ (b) 9

SUPPLEMENTARY EXERCISE 3 (P.100)

1. (a) (i) $a = 4, h = 3, k = -9$
 (ii) minimum = -9
- (b) (i) $a = -10, h = 2, k = \frac{1}{10}$
 (ii) maximum = $\frac{1}{10}$
2. (a) minimum = $-\frac{9}{4}, x = \frac{3}{2}$
 (b) maximum = 20, $x = -3$
 (c) minimum = $\frac{9}{2}, x = \frac{1}{2}$
 (d) maximum = 17, $x = -4$
3. $P = \$100(-x^2 + 5x - 6), \2.5

4.
 5. (a)
 (b)
 6. (a)
 (b)
 7. (a)
 (b)

EXERCISE

1.

2.

3.

EXERCISE

1.

3.

5.

7.

9.

11.

13.

15.

17.

19.