

SUPPLEMENTARY EXERCISE 6 (P. 235)

1. (a) 0.221 5 (b) -0.206 3 (c) 1.145
 2. (a) -0.21 (b) 0 (c) 0.11
 3. -0.032 6 4. 1.3
 5. (a) 59° (b) 18°
 6. (a) $48^\circ 35'$ (b) $62^\circ 51'$
 7. (a) 7.1° (b) 10°
 8. (a) $\frac{2}{\sqrt{13}}$ (b) $\frac{2}{\sqrt{13}}$ (c) $\frac{2}{5}$
 (d) $\frac{5}{\sqrt{29}}$ (e) $\frac{3}{\sqrt{13}}$ (f) $\frac{5}{2}$
 9. (a) $\tan \theta = \frac{a}{c}$ (b) $\tan \theta = \frac{b}{d}$
 10. $y = 10$, $\theta = 30^\circ$ 11. $x = 5.69$
 12. $\theta = 18.43^\circ$ 13. $x = 27.3$, $y = 14.1$
 14. $\theta = 60^\circ$ 15. $x = 10.6$, $y = 21.2$
 16. (a) 107 m^2 (b) 4.33 cm^2
 17. $AB = 48 \text{ m}$, $AC = 30 \text{ m}$, $BC = 60 \text{ m}$
 18. 3.78 cm 19. (a) 0.5 m (b) 0.07 m
 20. 8

HARDER PROBLEMS 6 (P. 238)

1. (a) $\frac{1}{3} \tan \theta$
 (b) (i) 21° (ii) 17 cm
 2. (a) 5.96 cm (b) 50.16° (c) 8.41 cm
 3. (a) 2.6 m (b) 11.5 m
 4. (a) 36.87° (b) 4.87 cm (c) 2.77 cm^2
 5. (a) $QR = 2.52 \text{ m}$, $OR = 1.63 \text{ m}$
 (b) 20.43°
 6. 55.5°

EXERCISE 7A (P. 242)

(Level 1)

1. $a - 2$ 2. $\frac{-4}{a+b}$ 3. $\frac{-(q+r)}{p}$
 4. $\frac{c-d}{a+b}$ 5. $\frac{h}{f-g}$ 6. $\frac{h}{k}$
 7. $bc - a$ 8. $\frac{bc+de}{a}$

(Level 2)

9. $\frac{c}{a} + 5$ 10. $\frac{k-1}{k^2}$ 11. $\frac{d-b}{a+c}$
 12. $\frac{2pq}{q-p}$ 13. $\frac{ma-nb}{m+n}$ 14. $\frac{pqr}{p-q}$
 15. $rs - p - q$ 16. $\frac{cd}{d-c}$ 17. $\frac{pqr}{p+r}$
 18. $\frac{b}{cd-a}$ 19. $\frac{b}{a-d-e}$ 20. $\frac{pa-qk}{pk-qa}$

EXERCISE 7B (P. 244)

(Level 1)

1. 12 2. -40 3. 12
 4. 52 5. 3 6. 15
 7. 6 8. 3

(Level 2)

9. $\frac{1}{3}$ 10. $\frac{1}{5}$ 11. 3
 12. 10 13. 4 14. 16
 15. 2 16. 7.5 17. 3
 18. 8 19. 3.8 20. -6
 21. 10 22. 10

EXERCISE 7C (P. 247)

(Level 1)

1. $u = v - at$ 2. $b = \frac{V}{\ell h}$ 3. $V = \frac{CT}{P}$

4. $C = \frac{5}{9}(F - 32)$ 5. $x = \frac{y-c}{m}$

6. $M = \frac{L-b}{a+3}$ 7. $w = \frac{P}{2} - \ell$

8. $v = 1 - \frac{A}{K}$ 9. $m = \frac{T}{g-f}$ 10. $A = x^2$

(Level 2)

11. $x = \frac{py}{q+r}$ 12. $m = \frac{2E}{v^2}$ 13. $a = \frac{2(s-ut)}{t^2}$

14. $n = \frac{a}{c(b-1)}$ 15. $\alpha = \frac{x-L}{tL}$

16. $T = \frac{2t}{nH} + 10$ 17. $n = \frac{\ell-a}{d} + 1$

18. $h = \frac{A}{2\pi r} - r$ 19. $x = \frac{a+b}{a-b}$

20. $y = \frac{b(a-x)}{a}$ 21. $p = \frac{abq}{a+b}$

22. $P = \frac{100A}{100+nr}$ 23. $R = 1 - \frac{a}{M}$

24. $a = \frac{S(1-R)}{1-R^n}$ 25. $g = \frac{1}{1-F}$

26. $x = \frac{a}{y-c+1}$ 27. $b = \frac{a}{2-a}$

28. $y = \frac{1-x}{1+x}$ 29. $\ell = \frac{SR+a}{R+S}$

30. $f = \frac{uv}{u+v}$ 31. $x = \frac{y}{1-cy}$

32. $Q = \frac{I^2 R q}{q - i^2 R}$ 33. $T = \frac{V(2-P)}{4P+4+R}$

34. $b = k - \frac{ac}{c-a}$ 35. $v = \frac{6a}{U^2}$

36. $m = \frac{T}{4f^2 L^2}$ 37. $h = \frac{100-k}{M^2}$

38. $x = \frac{4(y+1)^2}{5a}$

39. $b = \frac{36}{a^2 l^2} - a^2$

40. $c = \pm \sqrt{\frac{E}{m}}$

41. $h = \pm \sqrt{\frac{S}{\pi} - \frac{1}{4}d^2}$

42. $y = b \pm \sqrt{r^2 - (x-a)^2}$

EXERCISE 7D (P. 250)

(Level 1)

1. (a) $w = \frac{P}{2} - \ell$ (b) 4 cm

2. (a) $n = \frac{360^\circ}{180^\circ - \theta}$ (b) 15

3. (a) $t = 40\,000\left(\frac{\ell}{L} - 1\right)$ (b) 80

(Level 2)

4. (a) $a = \frac{bc}{b-c}$ (b) 30

5. (a) 20 m (b) $t = \sqrt{\frac{d}{5}}$ (c) 3 s

6. (a) $\ell = \frac{5T^2}{2\pi^2}$ (b) 2.5 m

7. (a) $h = \frac{A}{2\pi r} - r$ (b) $12\frac{1}{2}$

8. (a) $r = \sqrt{R^2 - \frac{A}{\pi}}$ (b) 4 cm

9. (a) 35
(b) (i) $n = \frac{3}{2} + \sqrt{2D + \frac{9}{4}}$ (ii) 8

SUPPLEMENTARY EXERCISE 7 (P. 253)

1. $\frac{c^2}{a-b}$ 2. $\frac{v^2}{2(H-h)}$ 3. $\frac{mn^2}{c(1+mn^2)}$

4. $\frac{2pq}{p-2q}$ 5. $\frac{m(a+b)}{a-b}$ 6. 900°

278 Answers

7. 56 8. $\frac{1}{2}$ 9. 15
 10. 8 11. 2 12. -3
 13. $10\sqrt{3}$ 14. $h = \frac{A - \pi r^2}{2\pi r}$
 15. $R = 100\left(1 - \frac{D}{P}\right)$ 16. $n = \frac{180^\circ + \theta}{2(180^\circ - \theta)}$
 17. $n = \frac{h(1+k)}{k(2-h)}$ 18. $m = \frac{rs}{f(s-r)} + 1$
 19. $x = \frac{yz+z-y}{yz-z+y}$ 20. $v = c\sqrt{1 - \frac{m^2}{M^2}}$
 21. $r = 100\left(\sqrt{1 + \frac{I}{P}} - 1\right)$
 22. (a) (i) $P = \frac{100A}{100+nR}$ (ii) 600
 (b) (i) $n = \frac{100(A-P)}{PR}$ (ii) 7
 23. (a) $\cos \theta = \frac{a^2 + b^2 - c^2}{2ab}$ (b) 90°

HARDER PROBLEMS 7 (P. 255)

1. (a) $t = \pm\sqrt{1-x}$ (b) $y = 1 - t^2$
 (c) $y = x$
 2. (a) $PS = \sqrt{b^2 - (c-a)^2}$
 (b) (i) $A = \frac{1}{2}(a+c)\sqrt{b^2 - (c-a)^2}$
 (ii) $b = \sqrt{\frac{4A^2}{(a+c)^2} + (c-a)^2}$
 3. (b) $3\sqrt{3}$ cm

CUMULATIVE TEST A (P. 257)

1. 40 km/h
 2. (a) $-6x^3 + 11x^2 - 14x + 5$
 (b) (i) $x^2 - 3x + 9$ (ii) 9.31

3. (a) wearing glasses: $\frac{1}{4}x$, not wearing glasses: $\frac{3}{4}x$
 (b) 40
 4. (a) $\angle BEF = 2x$, $x = 30^\circ$
 (b) BE = 1.2
 5. (a) AP = 80 m, BQ = 125 m
 (b) AQ = 100 m, AB = 75 m
 6. (a) $(x+1)(x^2+1)$
 (b) (i) $x^3 + x^2 + x + 1$
 (ii) $x^2 + 1$
 7. (a) 28 m^2
 (b) 10 m

CUMULATIVE TEST B (P. 259)

1. (a) upper limit = 5.5 s, lower limit = 4.5 s
 (b) upper limit = 22.5 m, lower limit = 21.5 m
 (c) upper limit = 5 m/s, lower limit = 3.9 m/s
 2. (a) $x = 15^\circ$, $\angle QST = 60^\circ$, $\angle QTS = 60^\circ$,
 equilateral triangle
 (b) 30°
 3. (a) 1 250 (b) 4
 4. (a) (i) $2x^3 + x^2y - 4xy^2 - 2y^3$
 (ii) $2 - 4x - x^2 + 2x^3$
 (iii) 35
 (b) $\frac{-(x+y)}{x}$
 5. (a) $\sqrt{2} 225$ cm (c) 42.40
 6. (a) (i) $\sqrt{29}$ m (ii) 4.488 s
 (b) 4.375 s, yes
 7. (a) 84
 (b) (i) $s = \sqrt{\frac{1}{0.384}\left(\frac{65.4 Ld}{N} - 600\right)}$
 (ii) 12 km/h