

2.1 Basic algebra

1 a $5a + 3$ b $-5b + 18$ c $10a$ d $2a^2 + 3b^2$

2 a $xy(2x + y)$ b $2x^2y^2(5x - 2y)$
 c $3x^3yz(xy + 2z)$ d $3xy(4x^3y + 2xy - 3)$

3 a $4a^4b^2$ b $9a^3b^2(3b^4 + a)$
 c $4a^2b^4(2a + b)(2a - b)$

4 a $Q = \frac{P}{3} - 4$ (or $\frac{P-12}{3}$)

b $B = \frac{2A+1}{3}$ c $T = \frac{R+3}{2}$

d $D = \frac{2C-5}{12}$ e $V = 9U^2 - 2$

f $N = \sqrt[3]{\frac{2M}{\pi}} + 1$

5 a $r = \sqrt[3]{\frac{3V}{4\pi}}$ b 3 cm

6 a Hint: The quarter-circle has area $\frac{1}{4}\pi(2x)^2$

b $x = \sqrt{\frac{A}{4-\pi}}$

c Hint: The quarter-circle has perimeter $\frac{1}{4}(2\pi)(2x)$

7 a Hint: Start by expressing t in terms of m using $\tan \hat{A} = \frac{\text{opposite}}{\text{adjacent}}$

b $m = \sqrt{\frac{n^2-2}{2}}$

8 a $x = \pm\sqrt{y} - 3$

b $x = 1 \pm \sqrt{\frac{y+1}{4}}$ (or $x = 1 \pm \frac{1}{2}\sqrt{y+1}$)

c $x = \frac{5 \pm \sqrt{3y}}{2}$

9 a Hint: Use the rule $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$

b $Q = \frac{3}{P-2}$

10 a $B = \frac{2}{1-A}$ b $D = \pm\sqrt{\frac{4}{C-1}}$

c $F = \sqrt[3]{\frac{5}{E+4}}$

11 a $B = \frac{2A}{A-1}$ b $D = \frac{2-3C}{2C-1}$ c $F = \pm\sqrt{\frac{3-E}{E-1}}$

12 a $x + 3$ b $2x^2 + 4$ c $3x$ d $-x^2$

13 a $x^2 + \frac{4}{3}x + 2, A = 1, B = \frac{4}{3}, C = 2$

b $2x - \frac{3}{2}x^{-1}, A = 2, B = \frac{3}{2}$

c $2x^2 + \frac{1}{3}x^{-2} + 3, A = 2, B = \frac{1}{3}, C = 3$

d $4x^3, A = 4, n = 3$

2.2 Solving linear equations

1 a 5 b 8 c 3 d -3

2 a 5 b $\frac{1}{5}$ c -4

3 a 4 b 8 c 6

4 a 3 b $\frac{1}{2}$ c $\frac{1}{4}$

5 a 4 b $\frac{3}{2}$

6 a Hint: Substitute $x = 6$ and $y = 3$ into the equation.

b 8

7 a $x = 2, y = 3$ b $x = 7, y = -1$

c $x = \frac{1}{2}, y = -\frac{3}{2}$

8 a $2(5x - 1)$ b $\frac{7}{2}$ c 68 cm^2

9 a Hint: The circumference of a semi-circle radius x is πx .

b $18\,800 \text{ cm}^2$ (3 sig. figs)

10 a 7

b 12

c 3