

Chapter 7 Answers

Exercise 7A

- 1 **a** **i** 7 **ii** 6.5 **iii** 6.1
 iv 6.01 **v** $h + 6$
b 6
- 2 **a** **i** 9 **ii** 8.5 **iii** 8.1
 iv 8.01 **v** $8 + h$
b 8

Exercise 7B

- 1 $7x^6$ 2 $8x^7$ 3 $4x^3$
 4 $\frac{1}{3}x^{-\frac{2}{3}}$ 5 $\frac{1}{4}x^{-\frac{4}{3}}$ 6 $\frac{1}{3}x^{-\frac{2}{3}}$
 7 $-3x^{-4}$ 8 $-4x^{-5}$ 9 $-2x^{-3}$
 10 $-5x^{-6}$ 11 $-\frac{1}{3}x^{-\frac{4}{3}}$ 12 $-\frac{1}{2}x^{-\frac{3}{2}}$
 13 $-2x^{-3}$ 14 1 15 $3x^2$
 16 $9x^8$ 17 $5x^4$ 18 $3x^2$

Exercise 7C

- 1 **a** $4x - 6$ **b** $x + 12$ **c** $8x$
 d $16x + 7$ **e** $4 - 10x$
 2 **a** 12 **b** 6 **c** 7
 d $2\frac{1}{2}$ **e** -2 **f** 4
 3 4, 0
 4 (-1, -8)
 5 1, -1
 6 6, -4

Exercise 7D

- 1 **a** $4x^3 - x^{-2}$ **b** $-x^{-3}$ **c** $-x^{-\frac{3}{2}}$
 2 **a** 0 **b** $11\frac{1}{2}$
 3 **a** $(2\frac{1}{2}, -6\frac{1}{4})$ **b** (4, -4) and (2, 0)
 c (16, -31) **d** $(\frac{1}{2}, 4)$ $(-\frac{1}{2}, -4)$

Exercise 7E

- 1 **a** $x^{-\frac{1}{2}}$ **b** $-6x^{-3}$ **c** $-x^{-4}$
 d $\frac{4}{3}x^3 - 2x^2$ **e** $-6x^{-4} + \frac{1}{2}x^{-\frac{1}{2}}$
f $\frac{1}{3}x^{-\frac{2}{3}} - \frac{1}{2}x^{-2}$ **g** $-3x^{-2}$ **h** $3 + 6x^{-2}$
i $5x^{\frac{3}{2}} + \frac{3}{2}x^{-\frac{1}{2}}$ **j** $3x^2 - 2x + 2$ **k** $12x^3 + 18x^2$
l $24x - 8 + 2x^{-2}$
 2 **a** 1 **b** $\frac{2}{9}$ **c** -4 **d** 4

Exercise 7F

- 1 $24x + 3, 24$
 2 $15 - 3x^{-2}, 6x^{-3}$
 3 $\frac{9}{2}x^{-\frac{1}{2}} + 6x^{-3}, -\frac{9}{4}x^{-\frac{3}{2}} - 18x^{-4}$
 4 $30x + 2, 30$
 5 $-3x^{-2} - 16x^{-3}, 6x^{-3} + 48x^{-4}$

Exercise 7G

- 1 $2t - 3$ 2 2π
 3 $-12t^{-2}$ 4 9.8
 5 $1 - 5r^{-2}$ 6 $-12 + 8t$
 7 $10 - 2x$

Exercise 7H

- 1 **a** $y + 3x - 6 = 0$ **b** $4y - 3x - 4 = 0$
 c $3y - 2x - 18 = 0$ **d** $y = x$
 e $y = 12x + 14$ **f** $y = 16x - 22$
 2 **a** $7y + x - 48 = 0$ **b** $17y + 2x - 212 = 0$
 3 $(\frac{2}{9}, \frac{18}{9})$
 4 $y = -x, 4y + x - 9 = 0; (-3, 3)$
 5 $y = -8x + 10, 8y + x - 145 = 0$

Exercise 7I

- 1 4, $11\frac{3}{4}$, $17\frac{25}{27}$
 2 0, $\pm 2\sqrt{2}$
 3 (-1, 0) and $(\frac{2}{3}, 9\frac{13}{27})$
 4 2, $2\frac{2}{3}$
 5 (2, -13) and (-2, 15)
 6 **a** $1 - \frac{9}{x^2}$ **b** $x = \pm 3$
 7 $x = 4, y = 20$
 8 $\frac{3}{2}x^{-\frac{1}{2}} + 2x^{-\frac{3}{2}}$
 9 **a** $\frac{dy}{dx} = 6x^{-\frac{1}{2}} - \frac{3}{2}x^{\frac{1}{2}}$ **b** (4, 16)
 $= \frac{1}{2}x^{-\frac{1}{2}}(12 - 3x)$
 $= \frac{3}{2}x^{-\frac{1}{2}}(4 - x)$
 10 **a** $x + x^{\frac{3}{2}} - x^{-\frac{1}{2}} - 1$
 b $1 + \frac{3}{2}x^{\frac{1}{2}} + \frac{1}{2}x^{-\frac{3}{2}}$
 c $4\frac{1}{16}$
 11 $6x^2 + \frac{1}{2}x^{-\frac{1}{2}} - 2x^{-2}$
 12 $\frac{10}{3}, \frac{2300\pi}{27}$
 14 $a = 1, b = -4, c = 5$
 15 **a** $3x^2 - 10x + 5$
 b **i** $\frac{1}{3}$ **ii** $y = 2x - 7$ **iii** $\frac{7}{2}\sqrt{5}$
 16 $y = 9x - 4$ and $9y + x = 128$
 17 **a** $(\frac{4}{3}, -\frac{2}{3})$ **b** $\frac{1}{5}$