

3. (a)  $\frac{10a+20}{a^2}$  (b)  $\frac{4b-7}{(b-3)^2}$   
 (c)  $-\frac{2c+2}{(c+4)^2}$  (d)  $\frac{23d-16d^2}{(7-4d)^2}$   
 (e)  $-\frac{13f+9}{(2f+1)^2}$  (f)  $\frac{4h-8}{(h-8)^2}$   
 (g)  $\frac{3k-14}{(k+5)(k-5)}$   
 (h)  $\frac{m-9n+6}{(m-9n)^2}$   
 (i)  $\frac{2p+5}{(7p+4)(p+1)}$   
 (j)  $\frac{7q+20r}{(3q-8r)(2q+5r)}$   
 (k)  $\frac{17-x}{(x+1)(x+2)(x+3)}$   
 (l)  $\frac{y^2+5y-30}{2(y-3)(y+4)(y-5)}$
4.  $\frac{2y^2z^2-2yz^3+y-5z}{z(y-z)}$
5.  $A = h - 48, B = k - 6$
6.  $\frac{xy}{4(x-y)}$
7.  $A = 6, B = 3, C = -2$

#### Worksheet 6D: Equations involving algebraic fractions

1. (a)  $a = 1\frac{7}{15}$  (b)  $b = 40$   
 (c)  $c = 3\frac{4}{5}$  (d)  $d = \frac{1}{6}$   
 (e)  $h = -3\frac{1}{5}$  (f)  $k = \frac{5}{67}$   
 (g)  $m = -\frac{4}{11}$  (h)  $n = -4\frac{1}{5}$   
 (i)  $p = \frac{31}{32}$  (j)  $q = 10\frac{5}{6}$   
 (k)  $x = -1\frac{5}{12}$  (l)  $y = 4$
2. (a)  $a = 2\frac{2}{3}$  or  $a = -4$   
 (b)  $b = -4$  or  $b = 3$   
 (c)  $h = 10$  or  $h = -1$   
 (d)  $k = 1\frac{1}{4}$  or  $k = 3$   
 (e)  $m = \pm\frac{3}{7}$   
 (f)  $n = -1\frac{1}{2}$   
 (g)  $p = -6$  or  $p = 2$   
 (h)  $q = -1\frac{4}{7}$   
 (i)  $x = -9$  or  $x = 4$   
 (j)  $y = \pm\frac{1}{2}$  or  $y = \pm 4$
3. (a)  $a = -1\frac{2}{5}$  (b) No real solutions  
 (c)  $h = \frac{1}{7}$  (d)  $k = \frac{2}{3}$   
 (e)  $m = 6$  or  $m = -1$   
 (f)  $n = 7\frac{1}{2}$  or  $n = 10$

(g)  $p = 9\frac{1}{3}$  or  $p = -1\frac{1}{3}$

(h)  $q = \pm 2.74$

(i)  $x = \frac{5}{6}$  or  $x = 5$

(j)  $y = 1\frac{17}{21}$

4. (i)  $(3x+4)(x-2)$

(ii)  $-1\frac{11}{17}$

5.  $A = 200, B = 4$

6.  $\frac{5}{3}$  and  $\frac{3}{5}$

7. (i) 100 (ii) 7 h 9 min

#### Worksheet 6E: Manipulation of algebraic formulae

1. (a)  $p = \frac{y-4q}{7}$  (b)  $y = \frac{c-ax}{b}$   
 (c)  $b = \frac{hk}{ac}$  (d)  $m = \frac{4pq^3}{3n}$   
 (e)  $p = \frac{5q+8x}{4}$  (f)  $x = c + \frac{ab}{y}$   
 (g)  $l = \frac{2S}{n} - 2a$  (h)  $a = \frac{b^2-D}{4c}$   
 (i)  $u = \pm\sqrt{v^2-2gs}$   
 (j)  $T = \pm\sqrt{\frac{4\pi^2L}{g}}$   
 (k)  $a = \frac{y^2-b}{x^2}$  (l)  $p = \frac{(x+y)^3-q}{6}$   
 (m)  $x = \frac{c}{h-k}$  (n)  $r = \sqrt[3]{\frac{3V}{4\pi+3}}$   
 (o)  $x = \frac{6a}{a-y}$  (p)  $b = \frac{\pi ack}{1-\pi ck}$   
 (q)  $b = \frac{3a+3x}{a-x}$  (r)  $k = \pm\sqrt{\frac{h^2}{h+2}}$   
 (s)  $n = \pm\sqrt{\frac{m^2}{a+b}}$   
 (t)  $q = \frac{8pr}{5(12p-r)}$   
 (u)  $x = \left(\frac{q-b}{a-p}\right)^2$   
 (v)  $a = \frac{m^3(m-b^3n)}{n^4}$   
 (w)  $y = -x \pm 1$   
 (x)  $b = \frac{a^2x^2 \pm \sqrt{9ac}}{3y}$

2.  $b = \frac{A}{3\pi a} - 6a$

3. (i) 35 (ii)  $b = \pm\sqrt{a^2 - \frac{4h}{k}}$

4. (i) -1 (ii)  $g = \frac{2tu-2s}{t^2}$

5.  $x = \pm\sqrt{\frac{a+by}{y-1}}$

6.  $b = \pm\sqrt{\frac{a^2c^2}{a^2-c^2}}$

7.  $L = \frac{gT^2}{4\pi^2} - r$

8. (i)  $x^2 + y^2 = 36$

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

9. (i) \$6499.59

(ii)  $P = \frac{I}{\left(1 + \frac{R}{100}\right)^n - 1}$

(iii) \$28 800

10. (i)  $m = \frac{y-c}{x}$

#### Review Exercise 6

1. (a)  $\frac{3a^4}{10b^3}$  (b)  $\frac{6y}{2x-3y}$

2. (a)  $(2x-1)(x-4)$

(b) (i)  $x = \frac{1}{2}$  or  $x = 4$

(ii)  $\frac{2x-1}{x+4}$

3. (a)  $\frac{9x}{(x+4)(x-5)}$

(b)  $x = 0$  or  $x = 7$

4.  $\frac{5x-2}{6x+1}$

5.  $\frac{x+1}{x}$

6. (i) 61.6 (ii)  $r = \sqrt[3]{R^3 - \frac{3V}{\pi}}$

8. 3

#### Chapter 7 Direct and Inverse Proportions

##### Worksheet 7A: Direct proportion

1. (i) 1.6 cm (ii) 56 cm  
 2. 150  
 3. \$9.60  
 4.  $\frac{\$Cy}{x}$   
 5. \$14.40  
 6. 487.5 km  
 7. 52.7 g of carbohydrate,  
 6.67 g of protein, 5.61 g of fat,  
 162.45 mg of sodium  
 8. \$802  
 9. (i) No (ii) \$200

##### Worksheet 7B: Algebraic and graphical representations of direct proportion

1. (a) No (b) Yes  
 2. (a) No (b) No  
 4. (a) Yes (b) No  
 (c) No (d) Yes  
 5.  $p = 6.4, q = 12$