UNIT 12 *Formulae* Extra Exercises 12.1

1. If $x = 6$, $y = 7$ and $z = 8$, evaluate the following expressions:

   (a) $x + y$ (b) $z - x$ (c) $z + y$

   (d) $2x$ (e) $3y$ (f) $4z$

   (g) $x + y + z$ (h) $x + y - z$ (i) $z - y$

2. Calculate the values of the following expressions, if $a = 3$, $b = 7$ and $c = 5$.

   (a) ab (b) bc (c) ac

   (d) $2a + b$ (e) $2b + c$ (f) $3c + a$

   (g) $2b + 2c$ (h) $3a + 7b$ (i) $5b - 6c$

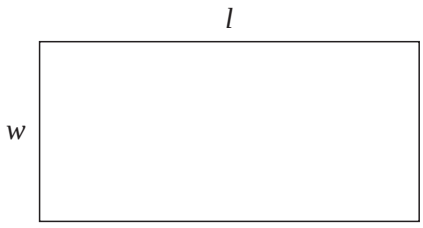
   (j) $6b + 3c$ (k) $3b - 2c$ (l) $6a - 2b$

3. Calculate the area and perimeter of the rectangle shown, if:

   (a) $l = 6$ and $w = 2$,

   (b) $l = 8$ and $w = 5$,

   (c) $l = 13$ and $w = 6$.



UNIT 12 *Formulae* Extra Exercises 12.2

1. Calculate:

(a) $3-8$ (b) $(-5)+8$ (c) $3-(-5)$

(d) $30+(-5)$ (e) $(-4)\times(-8)$ (f) $(-2)\times(-6)$

(g) $5\times(-7)$ (h) $(-4)-(-8)$ (i) $8-(-4)$

(j) $24\div(-6)$ (k) $(-20)\div(-4)$ (l) $100\div(-5)$

2. If $x=8$ $y=4$ and $z=-2$, calculate the values of the following expressions:

(a) $x+z$ (b) $x-z$ (c) xz

(d) $\dfrac{x}{z}$ (e) xyz (f) $xy+3z$

(g) $2x-5y$ (h) $4z+8y$ (i) $5x+2z$

3. If $a=4$, $b=5$ and $c=-10$, calculate the values of the following expressions:

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

(d) a^2 (e) b^2 (f) c^2

(g) a^2+c (h) a^2+b^2 (i) $\sqrt{a+b}$

(j) $\sqrt{3b-c}$ (k) $\dfrac{ab}{c}$ (l) $\dfrac{ab+c}{b}$

UNIT 12 *Formulae* Extra Exercises 12.3

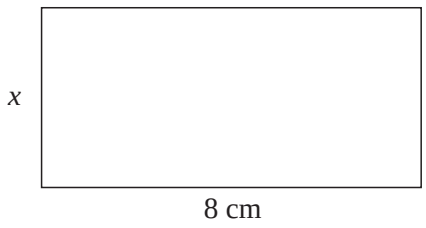
1. Solve the following equations

(a)	$3 + x = 8$	(b)	$5x = 40$	(c)	$x - 2 = 6$
(d)	$\frac{x}{2} = 14$	(e)	$2x = 14$	(f)	$3 + x = 15$
(g)	$x - 1 = 9$	(h)	$x - 4 = 12$	(i)	$3x = 27$
(j)	$5x = 45$	(k)	$\frac{x}{3} = 6$	(l)	$4x = 32$
(m)	$x - 2 = 3$	(n)	$6x = 42$	(o)	$x - 7 = 21$

2. Solve the following equations:

(a)	$3x = -12$	(b)	$2x = -40$	(c)	$\frac{x}{-2} = 8$
(d)	$x + 4 = 2$	(e)	$x - 3 = -2$	(f)	$x + 8 = 3$

3. The area of the rectangle shown is 24 cm^2.
   (a) Write down an equation involving x.
   (b) Calculate the value of x.



UNIT 12 *Formulae* Extra Exercises 12.4

1. Solve the following equations:

(a) $5x + 2 = 12$ (b) $6x - 3 = 21$ (c) $4x + 1 = 13$

(d) $2x + 7 = 21$ (e) $5x - 8 = 22$ (f) $4x + 1 = -7$

(g) $5x + 13 = 3$ (h) $4(x - 7) = 8$ (i) $3(2x + 7) = 27$

(j) $\frac{x}{4} + 2 = 5$ (k) $\frac{x + 2}{3} = 8$ (l) $\frac{2x + 6}{3} = 8$

2. Solve the following equations:

(a) $x + 2 = 2x - 1$ (b) $6x - 1 = 2x + 23$ (c) $4x + 2 = 5x + 1$

(d) $3x + 2 = 5x - 8$ (e) $3(2x + 1) = 4x + 19$ (f) $7x + 4 = 3(x + 8)$

3. A formula states:

$$s = \frac{1}{2}(u + v)t$$

(a) Calculate s, if $u = 3$, $v = 6$ and $t = 10$.

(b) Calculate t, if $s = 8$, $u = 1$ and $v = 3$.

(c) Calculate u, if $s = 52$, $v = 5$ and $t = 8$.

(d) Calculate v, if $s = 4$, $u = 6$ and $t = 8$.

UNIT 12 *Formulae* Extra Exercises 12.5

1. Complete the following table to solve the equation $x^3 = 100$, giving your answer correct to 1 decimal place.

x	x^3	*Comment*
4		
5		
4.5		
4.6		
4.7		
4.65		

2. Solve the equation

$$x^2 + x^3 = 50$$

giving your answer correct to:

(a) 1 decimal place,

(b) 2 decimal places.

3. Solve the equation

$$x + x^4 = 200$$

giving your answer correct to 2 decimal places.

UNIT 12 *Formulae* Extra Exercises 12.6

1. Make x the subject of each of the following formulae:

   (a) $y = 4x$ (b) $y = x + 4$ (c) $y = \frac{x}{6}$

   (d) $y = x - 7$ (e) $y = 2x + 1$ (f) $y = 3(x + 2)$

   (g) $y = 4(x - 6)$ (h) $y = \frac{x}{2} + 1$ (i) $y = 4x - 8$

2. Make t the subject of each of the following formulae:

   (a) $x = 4t + p$ (b) $x = bt - a$ (c) $y = xt + p$

   (d) $p = \frac{t}{2} + a$ (e) $q = \frac{t}{x} - b$ (f) $p = 2(t + r)$

3. The formula $p = \frac{22k}{10}$ can be used to convert kilograms to pounds. Make k the subject of this formula.

4. The cost, C, of a taxi journey is calculated using the formula

   $$C = 1.8 + 2d$$

   where d is the distance travelled, in miles. Make d the subject of this formula.

Extra Exercises 12.1 Answers

1. (a) 13 (b) 2 (c) 15
   (d) 12 (e) 21 (f) 32
   (g) 21 (h) 5 (i) 1

2. (a) 21 (b) 35 (c) 15
   (d) 13 (e) 19 (f) 18
   (g) 24 (h) 58 (i) 17
   (j) 57 (k) 11 (l) 4

3. (a) 12 , 16
   (b) 40 , 26
   (c) 78 , 38

Extra Exercises 12.2 Answers

1. (a) – 5 (b) 3 (c) 8
   (d) 25 (e) 32 (f) 12
   (g) – 35 (h) 4 (i) 12
   (j) – 4 (k) 5 (l) – 20

2. (a) 6 (b) 10 (c) – 16
   (d) – 4 (e) – 64 (f) 26
   (g) – 4 (h) 24 (i) 36

3. (a) 27 (b) 4 (c) – 12
   (d) 16 (e) 25 (f) 100
   (g) 6 (h) 41 (i) 3
   (j) 5 (k) – 2 (l) 2

Extra Exercises 12.3 Answers

1. (a) 5 (b) 8 (c) 8
   (d) 28 (e) 7 (f) 12
   (g) 10 (h) 16 (i) 9
   (j) 9 (k) 18 (l) 8
   (m) 5 (n) 7 (o) 28

2. (a) – 4 (b) – 20 (c) – 16
   (d) – 2 (e) 1 (f) – 5

3. (a) $8x = 24$ (b) 3 cm

Extra Exercises 12.4 Answers

1. (a) 2 (b) 4 (c) 3
   (d) 7 (e) 6 (f) – 2
   (g) – 2 (h) 9 (i) 1
   (j) 12 (k) 22 (l) 9

2. (a) 3 (b) 6 (c) 1
   (d) 5 (e) 8 (f) 5

3. (a) 45 (b) 4 (c) 8 (d) – 5

Extra Exercises 12.5 Answers

1.

x	x^3 to 1 d.p.	*Comment*
4	64	Too small
5	125	Too big
4.5	91.125	Too small
4.6	97.336	Too small
4.7	103.823	Too big
4.65	100.5	Too big

$4.6 < x < 4.65$

$x = 4.6$ to 1 d.p.

2. (a) 3.4 (b) 3.38

3. 3.74 or – 3.78

Extra Exercises 12.6 Answers

1. (a) $x = \frac{y}{4}$ (b) $x = y - 4$ (c) $x = 6y$

   (d) $x = y + 7$ (e) $x = \frac{y-1}{2}$ (f) $x = \frac{y}{3} - 2$ or $x = \frac{y-6}{3}$

   (g) $x = \frac{y}{4} + 6$ or $x = \frac{y+24}{4}$ (h) $x = 2(y-1)$ (i) $x = \frac{y+8}{4}$

2. (a) $t = \frac{x-p}{4}$ (b) $t = \frac{x+a}{b}$ (c) $t = \frac{y-p}{x}$ (d) $t = 2(p-a)$

   (e) $t = x(q+b)$ (f) $t = \frac{p}{2} - r$ or $t = \frac{p-2r}{2}$

3. $k = \frac{10p}{22} = \frac{5p}{11}$

4. $d = \frac{C - 1.8}{2}$