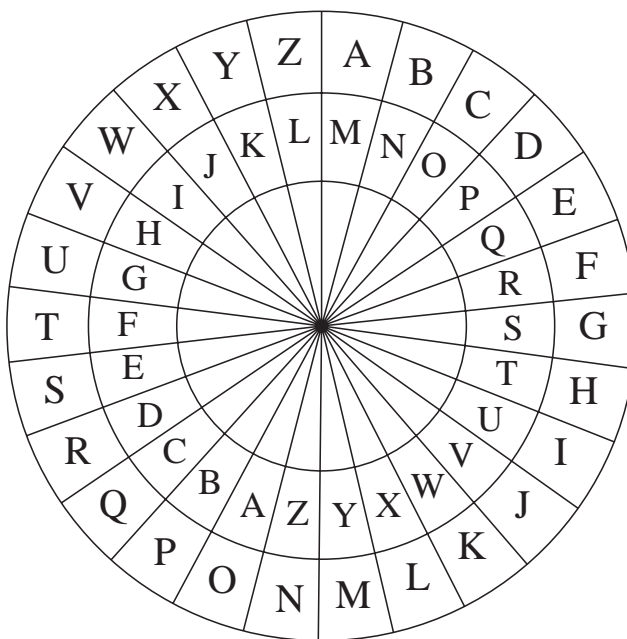# UNIT 16 *Algebra: Linear Equations*   **Extra Exercises 16.1**

1.   Use the codewheel below to decipher this word:

S X M P U M F A D E

2.   If $x = 3, \ y = 7$ and $z = 11,$ calculate:

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

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

(g) $3 + 2\,x$ (h) $4\,y - 3\,x$ (i) $2\,z + 5\,x$

3.   Simplify these expressions:

(a) $a + a + a$ (b) $2\,a + 4\,a$ (c) $6\,a - 3\,a$

(d) $4\,a + b - 2\,a$ (e) $3\,a + 3\,b + 2\,a$ (f) $6\,x + 6\,y - 3\,x + 2\,y$

(g) $4\,s + 3\,t - 2\,s + 2\,t$ (h) $4\,t + 3\,q - 2\,t + q$ (i) $3\,y + 8\,z - 4\,z - 2\,y$

UNIT 16 *Algebra: Linear Equations*   Extra Exercises 16.2

1. What is the output of each of these function machines:

    (a)   6 ⟶ | + 3 | ⟶ | × 5 | ⟶

    (b)   18 ⟶ | ÷ 3 | ⟶ | + 11 | ⟶

    (c)   31 ⟶ | − 14 | ⟶ | × 2 | ⟶

    (d)   − 2 ⟶ | − 5 | ⟶ | × 5 | ⟶

2. What is the input of each of these function machines:

    (a)   ? ⟶ | × 2 | ⟶ | + 9 | ⟶   19

    (b)   ? ⟶ | − 3 | ⟶ | ÷ 4 | ⟶   6

    (c)   ? ⟶ | + 11 | ⟶ | × 4 | ⟶   100

    (d)   ? ⟶ | ÷ 2 | ⟶ | − 14 | ⟶   − 11

    (e)   ? ⟶ | + 7 | ⟶ | × 7 | ⟶   35

3. A number is multiplied by 4 and then 9 is taken away from this to give 19. What was the first number?

4. At a bus stop, 6 people got off a bus and 13 people got on. If there are now 21 people on the bus, how many were on board before it stopped?

UNIT 16 *Algebra: Linear Equations*   **Extra Exercises 16.3**

1.   Solve these equations:

   (a) $x + 7 = 12$ (b) $x - 3 = 5$ (c) $x + 6 = 22$

   (d) $3x = 36$ (e) $4x = 10$ (f) $5x = 20$

   (g) $\dfrac{x}{2} = 5$ (h) $\dfrac{x}{3} = 2$ (i) $2x + 1 = 11$

   (j) $5x - 1 = 29$ (k) $2x + 16 = 20$ (l) $5x - 3 = 32$
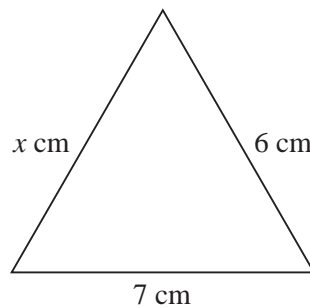
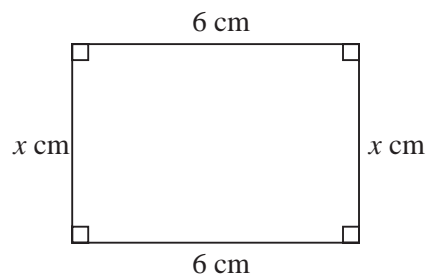   (m) $6x - 2 = 40$ (n) $\dfrac{x}{2} + 1 = 9$ (o) $5x + 11 = 6$

2.   (a)   Write down a formula for the perimeter of this triangle:

   (b)   If the perimeter is 18 cm, write down and solve an equation to find *x*.

   (c)   If the perimeter is 22 cm, write down and solve an equation to find *x*.

3.   The perimeter of this rectangle is 23 cm:

   Write down an equation and use it to find *x*.

4.   Solve these equations:

   (a) $4x + 6 = 3x + 10$ (b) $15 - 2x = 7$

Extra Exercises 16.1

Answers

1. GLADIATORS

2. (a) 10   (b) 4   (c) 21
   (d) 6   (e) 33   (f) 28
   (g) 9   (h) 19   (i) 37

3. (a) $3a$ (b) $6a$ (c) $3a$
   (d) $2a + b$ (e) $5a + 3b$ (f) $3x + 8y$
   (g) $2s + 5t$ (h) $2t + 4q$ (i) $y + 4z$

Extra Exercises 16.2

Answers

1. (a) 45   (b) 17   (c) 34   (d) –35

2. (a) 5   (b) 27   (c) 14
   (d) 6   (e) – 2

3. 7

4. 14

Extra Exercises 16.3   Answers

1. (a) 5   (b) 8   (c) 16

    (d) 12   (e) $2\frac{1}{2}$ (f) 4

    (g) 10   (h) 6   (i) 5

    (j) 6   (k) 2   (l) 7

    (m) 7   (n) 16   (o) -1

2. (a) $p = 13 + x$

    (b) $18 = 13 + x$

         $x = 5$

    (c) $22 = 13 + x$

         $x = 9$

3. $23 = 2x + 12$

    $x = 5\frac{1}{2}$ cm

4. (a) 4   (b) 4