



1

a. Solve $c - 8 = 11$

b. Solve $6d = 54$

c. Solve $e \div 4 = 7$

(3 marks)

a) Add 8 to both sides

$$c = 11 + 8 = 19$$

b) Divide both sides by 6

$$d = 54 \div 6 = 9$$

c) Multiply both sides by 4

$$e = 7 \times 4 = 28$$

2

Make x the subject of each equation.

a. $x + 5 = y$

b. $x - 3 = p$

c. $4x = t$

(3 marks)

a)

$$\begin{array}{rcl} x + 5 & = & y \\ - & & \\ x & = & y - 5 \end{array}$$

b)

$$\begin{array}{rcl} x - 3 & = & p \\ +3 & & \\ x & = & p + 3 \end{array}$$

c)

$$\begin{array}{rcl} 4x & = & t \\ \div 4 & & \\ x & = & \frac{t}{4} \end{array}$$

$$x = y - 5, x = p + 3, x = \frac{t}{4}$$

3 Solve $5x - 7 = 23$

(2 marks)

$$\begin{array}{rcl} +7 & 5x & = 30 & +7 \\ \div 5 & x & = 6 & \div 5 \end{array}$$

$$x = 6$$

4 Solve $4(2x - 3) = 36$

(3 marks)

Expand the bracket

$$\begin{array}{rcl} 8x - 12 & = & 36 \\ +12 & & +12 \\ 8x & = & 48 \\ \div 8 & & \div 8 \\ x & = & 6 \end{array}$$

$$x = 6$$

5 Solve

a. $3x + 11 = 2$

b. $2(y + 7) = 6$

c. $10 - 3w = 25$

(4 marks)

a)

$$\begin{array}{rcl} 3x + 11 & = & 2 \\ - & & - \\ 3x & = & -9 \\ \div 3 & & \div 3 \\ x & = & -3 \end{array}$$

b)

$$\begin{array}{rcl} 2(y + 7) & = & 6 \\ \div 2 & & \div 2 \\ y + 7 & = & 3 \\ - & & - \\ y & = & -4 \end{array}$$

c)

$$\begin{array}{rcl} 10 - 3w & = & 25 \\ - & & - \\ & = & 15 \\ \div -3 & & \div -3 \\ w & = & -5 \end{array}$$

$$x = -3, y = -4, w = -5$$

6 Solve $7x - 5 = 3x + 23$

(3 marks)

$$\begin{array}{rcl} 4x - 5 & = & 23 \\ +5 & & +5 \\ 4x & = & 28 \\ \div 4 & & \div 4 \\ x & = & 7 \end{array}$$

Check

$$7(7) - 5 = 44 \text{ and } 3(7) + 23 = 44$$

$$x = 7$$

7 Solve $5x + 9 = 2x - 6$

(3 marks)

$$\begin{array}{rcl} 5x + 9 & = & 2x - 6 \\ - & & - \\ 3x + 9 & = & - \\ - & & - \\ 3x & = & - \\ \div 3 & & \div 3 \\ x & = & - \end{array}$$

Check: $-25 + 9 = -16$ and $-10 - 6 = -16$

$$x = -5$$

8 Make x the subject of the formula

$$y = 2x + 9$$

(2 marks)

Making x the subject means leaving x alone on one side. Apply the same inverse operation to both sides to keep the equality true

$$\begin{array}{rcl} y - 9 & = & 2x \\ \div 2 & & \div 2 \\ x & = & \frac{y - 9}{2} \end{array}$$

$$x = \frac{y - 9}{2}$$

9

- a. Make r the subject of $A = 3(r + 2)$
 b. Make x the subject of $y = x^2 + 4$, where x is positive
 c. Make m the subject of $k = \sqrt{m}$

(3 marks)

a)

$$\begin{array}{l} A = 3(r + 2) \\ \div 3 \quad \frac{A}{3} = r + 2 \quad \div 3 \\ - \quad \frac{A}{3} - 2 = r \quad - \end{array}$$

b)

$$\begin{array}{l} y = x^2 + 4 \\ - \quad y - 4 = x^2 \quad - \\ \sqrt{\quad} \quad \sqrt{y - 4} = x \quad \sqrt{\quad} \end{array}$$

c)

$$\begin{array}{l} k = \sqrt{m} \\ \text{square} \quad k^2 = m \quad \text{square} \end{array}$$

$$\boxed{r = \frac{A}{3} - 2, x = \sqrt{y - 4}, m = k^2}$$

10

A rectangle has length $(3x + 2)$ cm and width $(x - 1)$ cm.

The perimeter of the rectangle is 50 cm.

Work out the length of the rectangle.

(4 marks)

$$\text{Perimeter} = 2(3x + 2) + 2(x - 1) = 6x + 4 + 2x - 2 = 8x + 2$$

$$8x + 2 = 50$$

$$8x = 48, \text{ so } x = 6$$

$$\text{Length} = 3(6) + 2 = 20 \text{ cm}$$

Check

$$\text{width} = 5 \text{ cm, perimeter} = 2(20) + 2(5) = 50 \text{ cm}$$

$$\boxed{20 \text{ cm}}$$

11

Jamal, Mei and Tobi collect football stickers.

Mei has 5 more stickers than Jamal.

Tobi has twice as many stickers as Jamal.

Altogether they have 61 stickers.

How many stickers does Tobi have?

(4 marks)

Let Jamal = x

Mei = $x + 5$, Tobi = $2x$

$$\begin{array}{rcl}
 x + x + 5 + 2x & = & 61 \\
 4x + 5 & = & 61 \\
 - & & - \\
 4x & = & 56 \\
 \div 4 & & \div 4 \\
 x & = & 14
 \end{array}$$

Tobi = $2 \times 14 = 28$

28 stickers

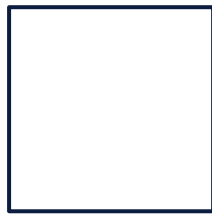
12

A square has sides of length $(2x - 3)$ cm.

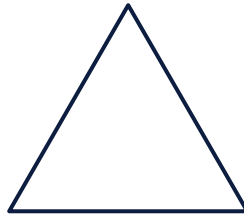
An equilateral triangle has sides of length $(x + 6)$ cm.

The square and the triangle have the same perimeter.

Work out the area of the square.



$2x - 3$



$x + 6$

Diagram NOT accurately drawn

(4 marks)

$$\begin{array}{rcl}
 4(2x - 3) & = & 3(x + 6) \\
 8x - 12 & = & 3x + 18 \\
 5x - 12 & = & 18 \\
 +12 & & +12 \\
 5x & = & 30 \\
 \div 5 & & \div 5 \\
 x & = & 6
 \end{array}$$

$$\text{Side} = 2 \times 6 - 3 = 9 \text{ cm}$$

$$\text{Area} = 9 \times 9 = 81$$

$$\boxed{81 \text{ cm}^2}$$