



1

a. Write down the inverse of each operation.

(i) add 7 (ii) multiply by 4 (iii) divide by 3

b. Mia thinks of a number. She multiplies it by 3 and then adds 8. Her answer is 29.

Use inverse operations to work out Mia's number.

(3 marks)

a)

(i) subtract 7

(ii) divide by 4

(iii) multiply by 3

b)

Work backwards, undo the last step first

$$29 - 8 = 21$$

$$21 \div 3 = 7$$

7

2

a. Solve $p + 9 = 4$

b. Solve $5q = -30$

c. Solve $r - 3 = -10$

(3 marks)

a) Subtract 9 from both sides

$$p = 4 - 9 = -5$$

b) Divide both sides by 5

$$q =$$

c) Add 3 to both sides

$$r =$$

3

Solve $5x - 7 = 23$

(2 marks)

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

$$\mathbf{x = 6}$$

4

a. Make x the subject of $y = x + 9$ b. Make a the subject of $P = 4a$ c. Make m the subject of $k = 3m - 2$

(3 marks)

a)

$$\begin{array}{rcl}
 y & = & x + 9 \\
 - & & - \\
 y - 9 & = & x
 \end{array}$$

$$x = y - 9$$

b)

$$\begin{array}{rcl}
 P & = & 4a \\
 \div 4 & & \div 4 \\
 \frac{P}{4} & = & a
 \end{array}$$

$$a = \frac{P}{4}$$

c)

$$\begin{array}{rcl}
 k & = & 3m - 2 \\
 +2 & & +2 \\
 k + 2 & = & 3m \\
 \div 3 & & \div 3 \\
 \frac{k + 2}{3} & = & m
 \end{array}$$

$$m = \frac{k + 2}{3}$$

5

Solve $3(x + 4) = 27$

(2 marks)

$$\begin{array}{rcl}
 \div 3 & & \div 3 \\
 x + 4 & = & 9 \\
 - & & - \\
 x & = & 5
 \end{array}$$

$$x = 5$$

6

Solve

a. $5(2x - 3) = 25$

b. $4(x + 6) = 10$

(3 marks)

a.)

$$\begin{array}{rcl}
 5(2x - 3) & = & 25 \\
 10x - 15 & = & 25 \\
 +15 & & +15 \\
 10x & = & 40 \\
 \div 10 & & \div 10 \\
 x & = & 4
 \end{array}$$

$$x = 4$$

b.)

$$\begin{array}{rcl}
 4(x + 6) & = & 10 \\
 4x + 24 & = & 10 \\
 -24 & & -24 \\
 4x & = & -14 \\
 \div 4 & & \div 4 \\
 x & = & -3.5
 \end{array}$$

$$x = -3.5$$

7

Priya thinks of a number.

She multiplies the number by 4 and then subtracts 9.

Her answer is 35.

Work out the number Priya thought of.

(3 marks)

Let n be the number, so $4n - 9 = 35$

$$\begin{array}{rcl}
 +9 & 4n & = & 44 & +9 \\
 \div 4 & n & = & 11 & \div 4
 \end{array}$$

Check

$$4 \text{ times } 11 = 44, 44 - 9 = 35$$

$$11$$

8

Ollie buys 4 cinema tickets and one large popcorn.

Each ticket costs £ t . The popcorn costs £6.

He pays £38 altogether.

a. Write an equation in t .

b. Solve your equation to find the cost of one ticket.

(3 marks)

a.)

$$4t + 6 = 38$$

b.)

$$\begin{array}{rcl} - & 4t & = 32 & - \\ \div 4 & t & = 8 & \div 4 \end{array}$$

$$\boxed{£8}$$

9

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

(3 marks)

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

Check

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

$$\boxed{x = 7}$$

10

Solve

a. $3(2x - 1) = 4x + 9$

b. $8 - 3x = 2x - 12$

(4 marks)

a)

$$\begin{array}{rcl}
 3(2x - 1) & = & 4x + 9 \\
 6x - 3 & = & 4x + 9 \\
 - & & - \\
 2x - 3 & = & 9 \\
 +3 & & +3 \\
 2x & = & 12 \\
 \div 2 & & \div 2 \\
 x & = & 6
 \end{array}$$

$$x = 6$$

b)

$$\begin{array}{rcl}
 8 - 3x & = & 2x - 12 \\
 +3x & & +3x \\
 8 & = & 5x - 12 \\
 +12 & & +12 \\
 20 & = & 5x \\
 \div 5 & & \div 5 \\
 4 & = & x
 \end{array}$$

$$x = 4$$

11

Amira and Josh collect football stickers. Every packet has the same number of stickers, n .

Amira has 5 full packets and 3 loose stickers.

Josh has 3 full packets and 19 loose stickers.

Amira and Josh have the same number of stickers.

Work out how many stickers Amira has.

(4 marks)

$$\text{Amira} = 5n + 3$$

$$\text{Josh} = 3n + 19$$

$$\begin{array}{rcl}
 5n + 3 & = & 3n + 19 \\
 - & & - \\
 2n + 3 & = & 19 \\
 - & & - \\
 2n & = & 16 \\
 \div 2 & & \div 2 \\
 n & = & 8
 \end{array}$$

$$\text{Amira} = 5 \times 8 + 3 = 43$$

$$43 \text{ stickers}$$

- 12 A rectangle has length $(2x + 5)$ cm and width $(x + 2)$ cm.

The perimeter of the rectangle is 38 cm.

Work out the area of the rectangle.

(5 marks)

$$\text{Perimeter} = 2(2x + 5) + 2(x + 2) = 6x + 14$$

$$6x + 14 = 38$$

$$6x = 24, \text{ so } x = 4$$

$$\text{Length} = 13 \text{ cm and width} = 6 \text{ cm}$$

Check

$$2(13) + 2(6) = 38 \text{ cm}$$

$$\text{Area} = 13 \text{ times } 6 = 78 \text{ cm}^2$$

78 cm^2
