



# Equations with Unknowns on Both Sides



REVISE THIS TOPIC

1 Solve  $6x + 10 = 2x + 18$  [3 marks]

$$\begin{aligned}
 & -2x \quad \left( 6x + 10 = 2x + 18 \right) \quad -2x \\
 & \quad \quad \quad \left( 4x + 10 = 18 \right) \quad -10 \\
 & \quad \quad \quad \quad \quad \left( 4x = 8 \right) \quad \div 4 \\
 & \quad \quad \quad \quad \quad \quad \quad \quad \left( x = 2 \right) \quad \div 4
 \end{aligned}$$

$x =$  2

2 Solve  $5y + 5 = 2y + 20$  [3 marks]

$$\begin{aligned}
 & -2y \quad \left( 5y + 5 = 2y + 20 \right) \quad -2y \\
 & \quad \quad \quad \left( 3y + 5 = 20 \right) \quad -5 \\
 & \quad \quad \quad \quad \quad \left( 3y = 15 \right) \quad \div 3 \\
 & \quad \quad \quad \quad \quad \quad \quad \quad \left( y = 5 \right)
 \end{aligned}$$

$y =$  5

3 Solve  $7w - 1 = 4w + 20$  [3 marks]

$$\begin{aligned}
 & -4w \quad \left( 7w - 1 = 4w + 20 \right) \quad -4w \\
 & \quad \quad \quad \left( 3w - 1 = 20 \right) \quad +1 \\
 & \quad \quad \quad \quad \quad \left( 3w = 21 \right) \quad \div 3 \\
 & \quad \quad \quad \quad \quad \quad \quad \quad \left( w = 7 \right)
 \end{aligned}$$

$w =$  7





4 Solve  $9a - 4 = 5a + 32$  [3 marks]

$$\begin{aligned} -5a \left( 9a - 4 = 5a + 32 \right) -5a \\ +4 \left( 4a - 4 = 32 \right) +4 \\ 4a = 36 \end{aligned}$$

$a = 9$

5 Solve  $4b - 3 = 3b + 27$  [3 marks]

$$\begin{aligned} -3b \left( 4b - 3 = 3b + 27 \right) -3b \\ +3 \left( b - 3 = 27 \right) +3 \\ b = 30 \end{aligned}$$

$b = 30$

6 Solve  $10c + 1 = 3c + 8$  [3 marks]

$$\begin{aligned} -3c \left( 10c + 1 = 3c + 8 \right) -3c \\ -1 \left( 7c + 1 = 8 \right) -1 \\ 7c = 7 \end{aligned}$$

$c = 1$

7 Solve  $5d + 15 = 2d + 9$  [3 marks]

$$\begin{aligned} -2d \left( 5d + 15 = 2d + 9 \right) -2d \\ -15 \left( 3d + 15 = 9 \right) -15 \\ 3d = -6 \end{aligned}$$

$d = -2$







12

Solve  $3r + 30 = 7r + 6$

[3 marks]

$$-3r \left( 7r + 6 = 3r + 30 \right) -3r$$

$$-6 \left( 4r + 6 = 30 \right) -6$$

$$4r = 24$$

$$r = 6$$

13

Solve  $2m - 30 = 9m - 2$

[3 marks]

$$-2m \left( 9m - 2 = 2m - 30 \right) -2m$$

$$+2 \left( 7m - 2 = -30 \right) +2$$

$$7m = -28$$

$$m = -4$$

14

Solve  $3n + 4 = 24 - 2n$

[3 marks]

$$+2n \left( 3n + 4 = 24 - 2n \right) +2n$$

$$-4 \left( 5n + 4 = 24 \right) -4$$

$$5n = 20$$

$$n = 4$$

15

Solve  $4t - 8 = 40 - 4t$

[3 marks]

$$+4t \left( 4t - 8 = 40 - 4t \right) +4t$$

$$+8 \left( 8t - 8 = 40 \right) +8$$

$$8t = 48$$

$$t = 6$$





16

Solve  $x + 7 = 5x - 3$

[3 marks]

$$\begin{aligned}
 & -x \quad \left( 5x - 3 = x + 7 \right) -x \\
 & +3 \quad \left( 4x - 3 = 7 \right) +3 \\
 & \qquad \qquad 4x = 10
 \end{aligned}$$

$$x = \underline{\qquad 2.5 \qquad}$$

17

Solve  $4(y + 3) = 2(y + 10)$

[3 marks]

$$\begin{aligned}
 & -2y \quad \left( 4y + 12 = 2y + 20 \right) -2y \\
 & -12 \quad \left( 2y + 12 = 20 \right) -12 \\
 & \qquad \qquad 2y = 8
 \end{aligned}$$

$$y = \underline{\qquad 4 \qquad}$$

18

Solve  $5(a - 5) = 2(a + 1)$

[3 marks]

$$\begin{aligned}
 & -2a \quad \left( 5a - 25 = 2a + 2 \right) -2a \\
 & +25 \quad \left( 3a - 25 = 2 \right) +25 \\
 & \qquad \qquad 3a = 27
 \end{aligned}$$

$$a = \underline{\qquad 9 \qquad}$$

19

Solve  $2(b + 5) = 7(b + 10)$

[3 marks]

$$\begin{aligned}
 & -2b \quad \left( 7b + 70 = 2b + 10 \right) -2b \\
 & -70 \quad \left( 5b + 70 = 10 \right) -70 \\
 & \qquad \qquad 5b = -60
 \end{aligned}$$

$$b = \underline{\qquad -12 \qquad}$$

