

# 1:12 | Simultaneous Equations

## Exercise 1:12

**1** Find the value of  $y$  if:

**a**  $x + y = 12$  and  $x = -3$

**b**  $2x - 4y = 1$  and  $x = 4$

**2** Find the value of  $x$  if:

**a**  $y = 5x - 4$  and  $y = 21$

**b**  $3x + y = 12$  and  $y = -6$

**3** **a** Does the line  $2x - 4y = 12$  pass through the point  $(14, 4)$ ?

**b** Does the point  $(4, 8)$  lie on the line  $6x - 2y = 7$ ?

**4** Use the graph to solve these pairs of simultaneous equations.

**a** 
$$\begin{cases} y = 2 \\ y = 2x - 6 \end{cases}$$

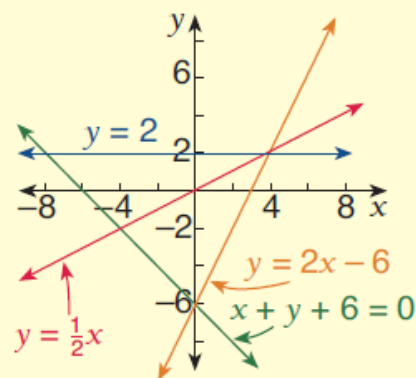
**b** 
$$\begin{cases} y = 2 \\ x + y + 6 = 0 \end{cases}$$

**c** 
$$\begin{cases} y = \frac{1}{2}x \\ x + y + 6 = 0 \end{cases}$$

**d** 
$$\begin{cases} y = \frac{1}{2}x \\ y = 2x - 6 \end{cases}$$

**e** 
$$\begin{cases} y = 2x - 6 \\ x + y + 6 = 0 \end{cases}$$

**f** 
$$\begin{cases} y = 2 \\ y = \frac{1}{2}x \end{cases}$$



**5** Solve these simultaneous equations by the substitution method.

**a** 
$$\begin{cases} 2x + y = 12 \\ 3x + 2y = 22 \end{cases}$$

**b** 
$$\begin{cases} 4x - 3y = 13 \\ 2x = y + 9 \end{cases}$$

**c** 
$$\begin{cases} y = x - 2 \\ 2x + y = 7 \end{cases}$$

**d** 
$$\begin{cases} 4a - b = 3 \\ 2a + 3b = 11 \end{cases}$$

**6** Solve these simultaneous equations by the elimination method.

**a** 
$$\begin{cases} 5x - 3y = 20 \\ 2x + 3y = 15 \end{cases}$$

**b** 
$$\begin{cases} 4a - 3b = 11 \\ 4a + 2b = 10 \end{cases}$$

**c** 
$$\begin{cases} 3c + 4d = 16 \\ 7c - 2d = 60 \end{cases}$$

**d** 
$$\begin{cases} 2x + 7y = 29 \\ 3x + 5y = 16 \end{cases}$$

**7** A theatre has 2100 seats. All of the rows of seats in the theatre have either 45 seats or 40 seats. If there are three times as many rows with 45 seats as there are with 40 seats, how many rows are there?

**8** Fiona has three times as much money as Jessica. If I give Jessica \$100, she will have twice as much money as Fiona. How much did Jessica have originally?



## Answers:

### Exercise 1:12

**1 a**  $y = 15$       **b**  $y = 1\frac{3}{4}$

**3 a** yes      **b** no

**4 a**  $x = 4, y = 2$       **b**  $x = -8, y = 2$       **c**  $x = -4, y = -2$       **d**  $x = 4, y = 2$       **e**  $x = 0, y = -6$       **f**  $x = 4, y = 2$

**5 a**  $x = 2, y = 8$       **b**  $x = 7, y = 5$       **c**  $x = 3, y = 1$       **d**  $a = 1\frac{3}{7}, b = 2\frac{5}{7}$

**6 a**  $x = 5, y = 1\frac{2}{3}$       **b**  $a = 2\frac{3}{5}, b = -\frac{1}{5}$       **c**  $c = 8, d = -2$       **d**  $x = -3, y = 5$

**7** 48      **8** \$20