

# Questions: Introduction to simultaneous equations

Ollie Brooke

## Summary

Questions relating to the introduction to simultaneous equations study guide.

*Before attempting these questions, it is highly recommended that you read [Guide: Introduction to simultaneous equations](#).*

## Q1

Find how many solutions exist for the following sets of simultaneous equations.

1.1.

$$x + 2y = 4$$

$$4x + 8y = 16$$

1.2.

$$-2x + 3y = 6$$

$$4x - 6y = -12$$

1.3.

$$3x + 4y = 2$$

$$8x + 2y = -1$$

## Q2

Using the substitution method, solve for  $x$  and  $y$  in the following pairs of simultaneous equations.

2.1.

$$x + 2y = -2$$

$$-4x - 6y = 4$$

2.2.

$$5x + y = 3$$

$$-10x - y = 7$$

2.3.

$$\begin{aligned}-5x + y &= 3 \\ 3x + 2y &= 12\end{aligned}$$

2.4.

$$\begin{aligned}4x + 3y &= 20 \\ 6x - 3y &= 12\end{aligned}$$

2.5.

$$\begin{aligned}7x - 2y &= 13 \\ 2x + 3y &= 17\end{aligned}$$

2.6.

$$\begin{aligned}4x + y &= 9 \\ 9x - y &= 4\end{aligned}$$

2.7.

$$\begin{aligned}3y &= 7 - x \\ 3x &= 4 + y\end{aligned}$$

### Q3

Using the elimination methods, solve for  $x$  and  $y$  in the following pairs of simultaneous equations.

3.1.

$$\begin{aligned}x + 3y &= 7 \\ 7x - 3y &= 1\end{aligned}$$

3.2.

$$\begin{aligned}-x + 4y &= -13 \\ 2x - 7y &= 22\end{aligned}$$

3.3.

$$\begin{aligned}8x + 4y &= 10 \\ 2x - 5y &= 3\end{aligned}$$

3.4.

$$\begin{aligned}5x + 6y &= 19 \\ 4x - 9y &= 6\end{aligned}$$

3.5.

$$7x - 3y = 20$$

$$3x + 5y = 9$$

3.6.

$$\frac{x}{2} + 4y = 3$$

$$\frac{y}{3} - 2x = 1$$

3.7.

$$-y + 1 = \frac{3x}{2}$$

$$2x - \frac{y}{3} = 5$$

## Q4

For the following sets of simultaneous equations, decide on the best method to use (between the substitution and elimination method) and solve for  $x$  and  $y$ .

4.1.

$$5x + 2y = 7$$

$$2x - y = 4$$

4.2.

$$3x + 4y = 12$$

$$2x - 2y = 8$$

4.3.

$$x - 7y = 5$$

$$2x + 5y = 9$$

4.4.

$$4x + 3y = 10$$

$$2x - 5y = -1$$

4.5.

$$x - 3y = 5$$

$$2x + 5y = 9$$

---

After attempting the questions above, please click [this link](#) to find the answers.

---

## **Version history**

v1.0: initial version created 12/24 by Ollie Brooke as part of a University of St Andrews VIP project.

[This work is licensed under CC BY-NC-SA 4.0.](#)