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.
$$\begin{aligned} x + 2y &= 4 \\ 4x + 8y &= 16 \end{aligned}$$

1.2.
$$\begin{aligned} -2x + 3y &= 6 \\ 4x - 6y &= -12 \end{aligned}$$

1.3.
$$\begin{aligned} 3x + 4y &= 2 \\ 8x + 2y &= -1 \end{aligned}$$

Q2

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

2.1.
$$\begin{aligned} x + 2y &= -2 \\ -4x - 6y &= 4 \end{aligned}$$

2.2.
$$\begin{aligned} 5x + y &= 3 \\ -10x - y &= 7 \end{aligned}$$

2.3.

$$-5x + y = 3$$
$$3x + 2y = 12$$

2.4.

$$4x + 3y = 20$$
$$6x - 3y = 12$$

2.5.

$$7x - 2y = 13$$
$$2x + 3y = 17$$

2.6.

$$4x + y = 9$$
$$9x - y = 4$$

2.7.

$$3y = 7 - x$$
$$3x = 4 + y$$

Q3

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

3.1.

$$x + 3y = 7$$
$$7x - 3y = 1$$

3.2.

$$-x + 4y = -13$$
$$2x - 7y = 22$$

3.3.

$$8x + 4y = 10$$
$$2x - 5y = 3$$

3.4.

$$5x + 6y = 19$$
$$4x - 9y = 6$$

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.