Questions: Introduction to simultaneous equations

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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.

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

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.

$$\begin{aligned} 7x - 3y &= 20 \\ 3x + 5y &= 9 \end{aligned}$$

3.6.

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

3.7.

$$\begin{aligned} -y + 1 &= \frac{3x}{2} \\ 2x - \frac{y}{3} &= 5 \end{aligned}$$

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.

$$\begin{aligned} 5x + 2y &= 7 \\ 2x - y &= 4 \end{aligned}$$

4.2.

$$\begin{aligned} 3x + 4y &= 12 \\ 2x - 2y &= 8 \end{aligned}$$

4.3.

$$\begin{aligned} x - 7y &= 5 \\ 2x + 5y &= 9 \end{aligned}$$

4.4.

$$\begin{aligned} 4x + 3y &= 10 \\ 2x - 5y &= -1 \end{aligned}$$

4.5.

$$\begin{aligned} x - 3y &= 5 \\ 2x + 5y &= 9 \end{aligned}$$

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.