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*](../studyguides/introtosimeqs.qmd)*.*

## Q1

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

1.1.

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

1.2.

$$ \begin{matrix}−2x+3y&=&6\\4x−6y&=&−12\end{matrix}$$

1.3.

$$ \begin{matrix}3x+4y&=&2\\8x+2y&=&−1\end{matrix}$$

## Q2

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

2.1.

$$ \begin{matrix}x+2y&=&−2\\−4x−6y&=&4\end{matrix}$$

2.2.

$$ \begin{matrix}5x+y&=&3\\−10x−y&=&7\end{matrix}$$

2.3.

$$ \begin{matrix}−5x+y&=&3\\3x+2y&=&12\end{matrix}$$

2.4.

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

2.5.

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

2.6.

$$ \begin{matrix}4x+y&=&9\\9x−y&=&4\end{matrix}$$

2.7.

$$ \begin{matrix}3y&=&7−x\\3x&=&4+y\end{matrix}$$

## Q3

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

3.1.

$$ \begin{matrix}x+3y&=&7\\7x−3y&=&1\end{matrix}$$

3.2.

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

3.3.

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

3.4.

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

3.5.

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

3.6.

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

3.7.

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

## 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.

$$ \begin{matrix}5x+2y&=&7\\2x−y&=&4\end{matrix}$$

4.2.

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

4.3.

$$ \begin{matrix}x−7y&=&5\\2x+5y&=&9\end{matrix}$$

4.4.

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

4.5.

$$ \begin{matrix}x−3y&=&5\\2x+5y&=&9\end{matrix}$$

[After attempting the questions above, please click this link to find the answers.](../answers/as-introtosimeqs.qmd)

## Version history

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

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