



T&T3 1.8



T&T3
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PROJECT MATHS

Text & Tests

Leaving 3 Certificate

Section 1.8 Simultaneous equations

Notes

The linear equations $3x + y = 9$
and $2x - y = 1$

are both satisfied by the values $x = 2$ and $y = 3$.

When two equations are both satisfied by the same values of x and y , they are said to be **simultaneous equations**.

We will solve simultaneous equations by eliminating one of the unknowns as shown in the following example.

Example 1

Solve the simultaneous equations

$$2x - 5y = 9$$

$$3x + 2y = 4$$

Example 2

Solve the simultaneous equations $3x - 2y = 19$

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

Exercise 1.8**Answer:** $x = 4, y = 1$

Solve the following pairs of simultaneous equations:

1. $x + 2y = 6$

$$3x - 2y = 10$$

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Solve the following pairs of simultaneous equations:

$$2. \quad \begin{array}{l} x + y = 7 \\ 2x + y = 12 \end{array} \quad (-1) \Rightarrow \begin{array}{r} -x - y = -7 \\ \underline{2x + y = 12} \\ x = 5 \end{array}$$

$$\begin{array}{l} (5) + y = 7 \\ \Rightarrow y = 2 \end{array} \quad | \quad -5$$

Verify

$$\begin{array}{l} (x) + y = 7 \\ (5) + (2) = 7 \\ 7 = 7 \quad \checkmark \end{array}$$

Exercise 1.8

Answer: $x = 3, y = 1$

Solve the following pairs of simultaneous equations:

4. $2x + 3y = 9$

$4x + y = 13$ (-3)

$$\begin{array}{r} 2x + 3y = 9 \\ -12x - 3y = -39 \\ \hline -10x = -30 \quad | \quad \div -10 \\ X = 3 \end{array}$$

$2(3) + 3y = 9$

$2(3) + 3(1) = 9$
 $6 + 3 = 9$
 $9 = 9$

~~2~~ $6 + 3y = 9$ $| -6$
 $\div 3$ $3y = 3$ $| \div 3$
 $y = 1$

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Exercise 1.8**Answer: $x = -1, y = -2$**

Solve the following pairs of simultaneous equations:

5. $3x - 2y = 1$
 $x - 5y = 9$

Exercise 1.8**Answer:** $x = 2, y = 3$

Solve the following pairs of simultaneous equations:

6. $2x + y = 7$
 $3x - 2y = 0$

Exercise 1.8**Answer:** $x = 4, y = 2$

Solve the following pairs of simultaneous equations:

7. $x + 2y = 8$
 $2x + 3y = 14$

Exercise 1.8**Answer:** $x = 5, y = -2$

Solve the following pairs of simultaneous equations:

8. $x - 2y = 9$

$$3x + 7y = 1$$

Exercise 1.8**Answer:** $x = \frac{13}{2}, y = 1$

Solve the following pairs of simultaneous equations:

9. $4x - 3y = 23$

$$2x - 5y = 8$$

Exercise 1.8**Answer:** $x = 3, y = 1$

Solve the following pairs of simultaneous equations:

10. $3x - 2y = 7$

$$4x + y = 13$$

Exercise 1.8**Answer:** $x = -2, y = 3$

Solve the following pairs of simultaneous equations:

11. $2x + 3y = 5$

$$5x - 2y = -16$$

Exercise 1.8**Answer:** $x = 6, y = 3$

Solve the following pairs of simultaneous equations:

12. $x + 2y = 12$

$$3x - 5y = 3$$

Exercise 1.8**Answer: $x = -2, y = 3$**

Solve the following pairs of simultaneous equations:

13. $3x - 2y = -12$
 $2x + 3y = 5$

Exercise 1.8**Answer: $x = 4, y = -3$**

Solve the following pairs of simultaneous equations:

14. $4x + 5y = 1$
 $3x - 4y = 24$

Exercise 1.8**Answer:** $x = -1, y = -1$

Solve the following pairs of simultaneous equations:

15. $x = 3 + 4y$

$$y = 2 + 3x$$

Exercise 1.8**Answer:** $x = 1, y = 5$

Solve the following pairs of simultaneous equations:

16. $3x + 4y = 23$

$$y = 2x + 3$$