

Boost Free Lessons - Year 10 Maths

Lesson 7: Simultaneous Equations: Elimination

Name: _____ Grade: _____ Date: _____

Worked Example 1

Solve $2x + y = 11$ and $3x - y = 9$

1. Look at the y terms. One is +y and the other is -y, so **adding** the equations removes y.
2. $(2x + 3x) + (y - y) = 11 + 9$, giving $5x = 20$.
3. So $x = 4$.
4. Substitute into the first equation: $2(4) + y = 11$, so $y = 3$.

$x = 4, y = 3$

Worked Example 2

Solve $3x + 2y = 16$ and $x + 2y = 8$

1. Both y terms are +2y, so this time **subtracting** removes y.
2. $(3x - x) + (2y - 2y) = 16 - 8$, giving $2x = 8$.
3. So $x = 4$.
4. Substitute into $x + 2y = 8$: $4 + 2y = 8$, so $2y = 4$ and $y = 2$.

$x = 4, y = 2$

Remember: Same signs means **subtract**, different signs means **add**. If neither variable matches, multiply one equation through first so a pair of coefficients becomes equal.



Question 1: Solve each pair by adding or subtracting the equations.

1. $x + y = 7$ and $x - y = 1$

2. $2x + y = 9$ and $x - y = 3$

3. $3x + y = 14$ and $2x - y = 6$

4. $x + 2y = 8$ and $x - 2y = 0$

5. $4x + y = 18$ and $2x + y = 10$

6. $5x + 2y = 24$ and $3x + 2y = 16$

7. $2x + 3y = 19$ and $2x + y = 9$

8. $3x - y = 5$ and $x + y = 7$



Question 2: Solve each pair. You will need to multiply one equation first.

1. $2x + y = 8$ and $x + 3y = 14$

2. $3x + 2y = 13$ and $x + y = 5$

3. $x + 2y = 10$ and $3x + y = 15$

4. $4x + 3y = 18$ and $2x + y = 8$

5. $5x - 2y = 4$ and $3x + y = 9$

6. $2x + 5y = 21$ and $3x - 2y = 3$



Question 3: Answer the following questions.

1. Three coffees and two muffins cost \$23. One coffee and two muffins cost \$13. Find the price of each.
2. Solve $4x + y = 17$ and $2x - y = 1$.
3. Two numbers have a sum of 25 and a difference of 7. Find them.
4. Two adults and three children cost \$54. One adult and two children cost \$31. Find each price.
5. Solve $5x + 3y = 27$ and $2x + 3y = 18$.





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Answers: Simultaneous Equations: Elimination**Question 1**

- | | |
|-------------------|-------------------|
| 1. $x = 4, y = 3$ | 5. $x = 4, y = 2$ |
| 2. $x = 4, y = 1$ | 6. $x = 4, y = 2$ |
| 3. $x = 4, y = 2$ | 7. $x = 2, y = 5$ |
| 4. $x = 4, y = 2$ | 8. $x = 3, y = 4$ |

Question 2

- | | |
|-------------------|-------------------|
| 1. $x = 2, y = 4$ | 4. $x = 3, y = 2$ |
| 2. $x = 3, y = 2$ | 5. $x = 2, y = 3$ |
| 3. $x = 4, y = 3$ | 6. $x = 3, y = 3$ |

Question 3

1. Coffee \$5 and muffin \$4
2. $x = 3, y = 5$
3. 16 and 9
4. Adult \$15 and child \$8
5. $x = 3, y = 4$

