

Practical Simultaneous Equations Problems

Starter

1. (Review of last lesson)

Solve the simultaneous equations $3x + 2y = 7$ and $2x - 3y = -4$.

N.B. Sum of two numbers = addition.

Difference of two numbers = subtraction.

2. The sum of two numbers, a and b , is 35 and the difference is 17.

(a) Write two equations involving a and b .

(b) Solve the equations to find the two numbers.

Notes

Simultaneous equation questions can also come disguised in the form of diagrams or worded questions.

Success criteria – worded simultaneous equations

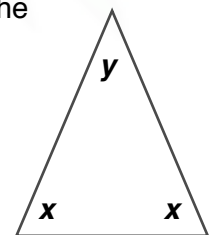
1. Assign useful letters to the things we are trying to work out. You don't need to use x and y so choose the first letter of the object you are trying to find.
2. By reading the question carefully, form two simultaneous equations.
3. Solve the simultaneous equations.
4. Answer the question asked (don't just leave your answer as $x =$, $y =$).

In the following questions write down two equations and, if necessary, rearrange them so they are ready to be solved simultaneously. **You do not need to solve the equations formed.**

E.g. 1 Twice one number plus the other number add up to 12. The sum of the two numbers is 7. Find the numbers.

E.g. 2 In the given triangle, angle x is 9° greater than angle y . Find the angles of the triangle.

Working: Angle x is 9° greater than angle y : $x = y + 9$
Sum of angles is 180° : $2x + y = 180$
In the correct form: $x - y = 9$
 $2x + y = 180$



E.g. 3 The cost of 2 cups and 3 plates is £18. The cost of 5 cups and 1 plate is £19. How much is a cup and how much is a plate?

E.g. 4 Adult tickets for a concert are £5 and children's tickets are £3. The amount of money from ticket sales was £103. If 29 people attended the concert, calculate how many adults and how many children attended.

Working: If a adults attended the concert, they would have paid $5a$
So the amount of money from ticket sales was £103: $5a + 3c = 103$
29 people attended the concert: $a + c = 29$

E.g. 5 The line $y = mx + c$ passes through the points (2, 5) and (4, 13). Find m and c .

Video: [Wording simultaneous equations](#)

[Solutions to Starter and E.g.s](#)

Exercise

Form **and** solve the equations.

9-1 class textbook: p383 M12.5 Qu 1-12

A*-G class textbook: p347 M12.5 Qu 1-12

9-1 homework book: p128 M12.5 Qu 1-11

A*-G homework book: p97 M12.5 Qu 1-8

Summary

Wording simultaneous equation questions:

1. Assign useful letters to the things we are trying to work out. You don't need to use x and y so choose the first letter of the object you are trying to find.
2. By reading the question carefully, form two simultaneous equations.
3. Solve the simultaneous equations.
4. Answer the question asked (don't just leave your answer as $x =$, $y =$).

[Homework book answers \(only available during a lockdown\)](#)