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MATERIAL!

# STARMAST

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We are using our colour-blind friendly design palette and branding in more areas of our website.

**MADE BY STUDENTS**  
We now have study guides published by previous VIP students.

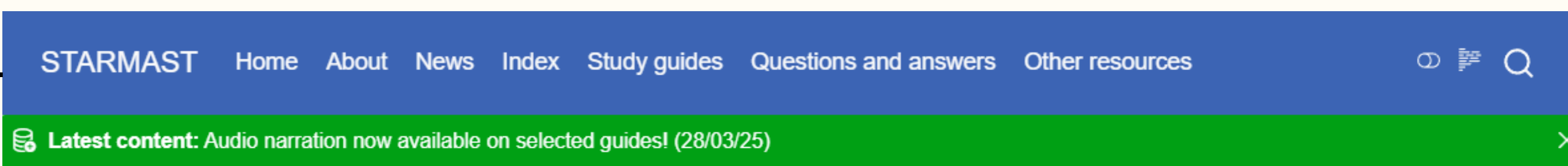
Links to study guides to help your understanding of this topic.

Step-by-step examples and explanations to show how various maths and stats concepts are applied in practice. These are designed to help learners tackle a variety of problems.

Learners can use the slider feature to explore how changing a value can affect a graph.

Quick check problems are designed to test learners on the fundamental aspects of the guide, before attempting the related question sheet.

A further reading list to encourage users to learn more on other topics.



## Introduction to solving simultaneous equations

ALGEBRA SOLVING EQUATIONS

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SUMMARY  
Solving simultaneous equations is a crucial skill in algebra. Understanding this concept allows you to find the common solution to a set of two equations. This guide will introduce you to finding if a pair of simultaneous equations in two variables has a solution or not, and then demonstrate two ways of solving a pair of simultaneous equations — the substitution method and the elimination method.

Before reading this guide, it is highly recommended that you read [Guide: Introduction to rearranging equations](#).

Narration of study guide: 0:00 / 21:08

**Example 3**  
Suppose you are given the following set of simultaneous equations:  $x + 2y = 5$  and  $3x + 3y = 6$ .  
To solve this using the elimination method, the goal is to eliminate one of the variables by making the coefficients of either  $x$  or  $y$  the same in both equations.

**Step 1.** In this case, you can eliminate  $x$  by multiplying the first equation by 3:

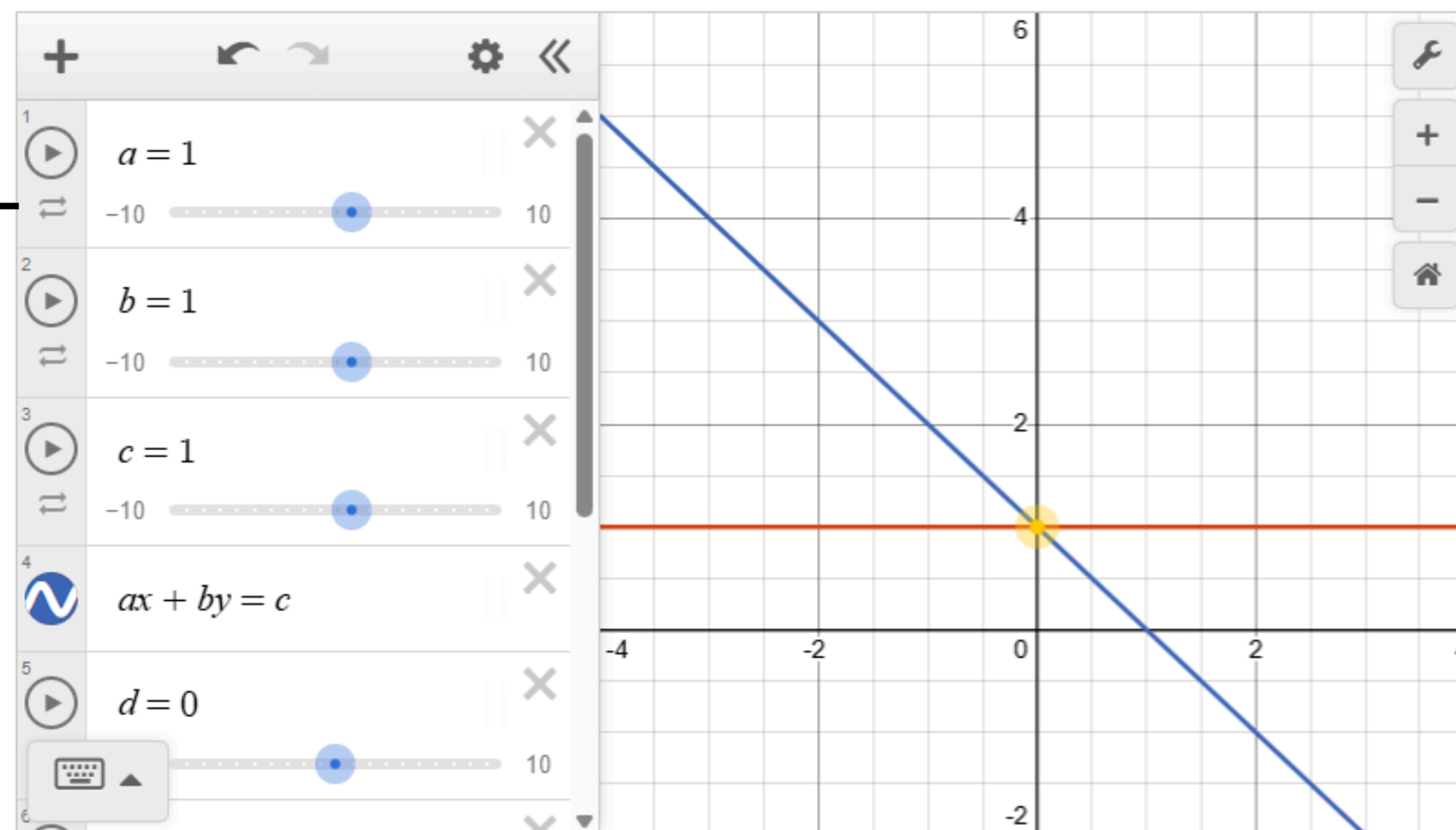
$$3x + 6y = 15$$

Notice that the  $x$  coefficients match in this equation and the equation  $3x + 3y = 6$ .

**Step 2.** Now, you can subtract the second simultaneous equation from  $3x + 6y = 15$ :

$$(3x + 6y) - (3x + 3y) = 15 - 6$$

**Tip**  
Two equations can share the same gradient even if their  $x$  and  $y$  coefficients are not matching. If one equation has a pair of  $x$  and  $y$  coefficients that is a multiple of the other equation's  $x$  and  $y$  coefficients, then the two equations have the same slope. For instance, the equation  $x - y = 1$  has the same gradient as  $2x - 2y = 1$



## Quick check problems

Use the elimination method to find the values of  $x$  and  $y$  in the following sets of simultaneous equations

$$2x + y = -9 \text{ and } 10x + 6y = -48$$

Answer:  $x =$  ,  $y =$

Show Answers

## Further reading

For more questions on the subject, please go to [Questions: Introduction to simultaneous equations](#).

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