Simultaneous equations and function families

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A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the worked example, then show each step in the practice questions. Attempt the reasoning and exact calculations by hand. Technology may check a result but cannot replace the written argument.

What you will practise

• Symbolic manipulation, parameters and simultaneous equations

Useful starting skills: Year 10 algebra, factorisation, functions, indices, geometry and elementary probability.

A parameter labels a family of rules; a variable ranges over values within one chosen rule. Use the given conditions to determine parameters.

To solve simultaneous equations, find values satisfying every equation at once. Always substitute solutions back, especially after squaring or dividing by an expression.

Worked example

A line $y=ax+b$ passes through$(1, 5)$, $(3, 11)$. Find a, b.

Subtract the two equations to give $2a=6$

substitute into $a+b=5$.

Answer: $a=3$, $b=2$.

Try it yourself

Name: _____ Date: _____

1. Solve $x+y=7$, $2x-y=2$.

2. Find a, b if $f(x)=ax^2+b$ has $f(1)=4$, $f(2)=10$.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. x=3, y=4.

Add to obtain 3 x=9.

2. a=2, b=2.

a+b=4 and 4 a+b=10; subtract to find a.

Curriculum reference: Mathematical Methods Units 1–2 — Symbolic manipulation, parameters and simultaneous equations

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