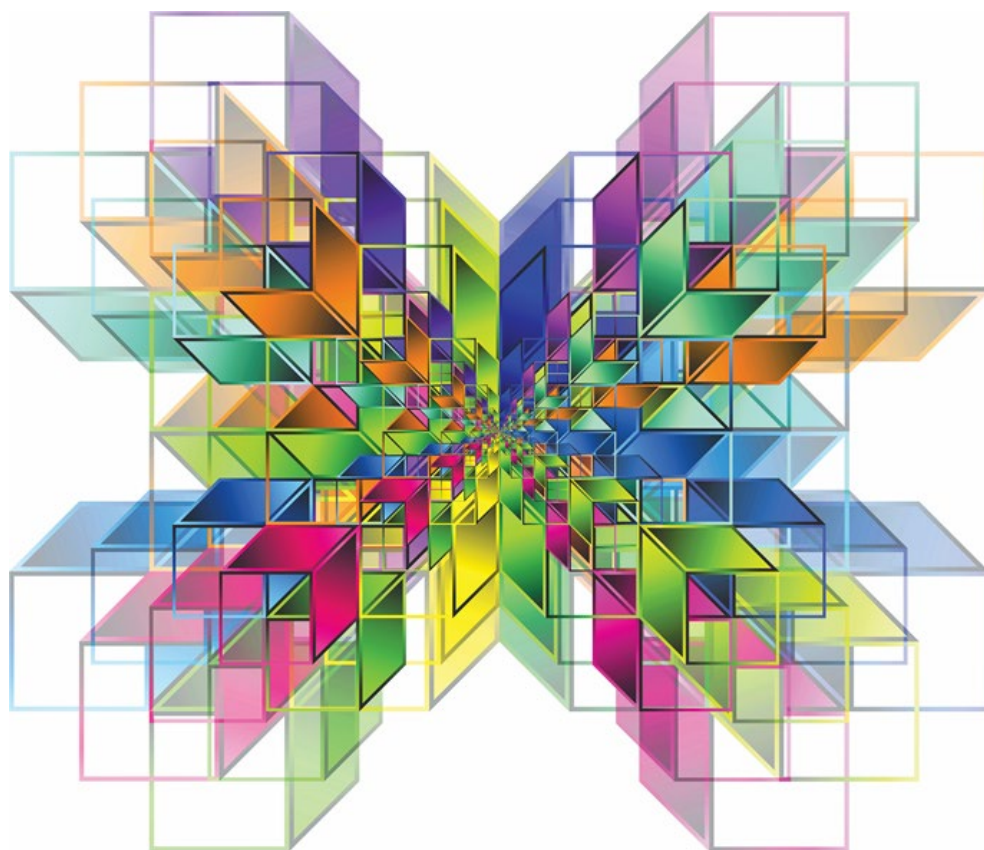


GCSE MATHS

Virtual Communities

Engaging explanations resources booklet

Published: Spring, 2022



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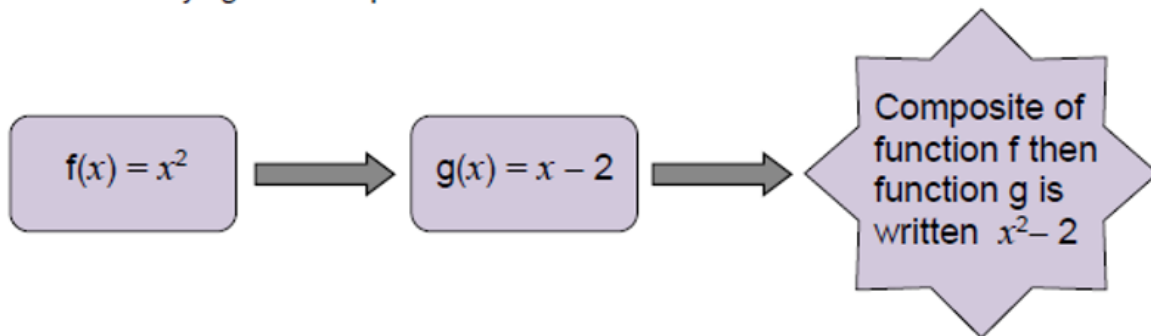
Bridging the gap

This set of AQA resources was originally designed to support teaching and learning for the cohorts of students who studied the 2007 Key Stage 3 Programme of Study and were preparing for the then new Mathematics GCSE (8300). The resources are still very useful for students in KS3-KS4. [KS3-4 Bridging the gap](#).

A composite function is a function that is made up of two other functions.

The order of the functions is important.

This is like carrying out two operations in a function machine.



Notice that if we did function $g(x)$ followed by $f(x)$ the answer would be $(x - 2)^2$

Key stage 3 tests

This series of termly tests covers Years 7, 8 and 9 and can be used to check understanding as well as showing younger students what GCSE papers look and feel like. Extension tests are included and analysers are available for all tests.

[AQA Key Stage 3 tests for Years 7, 8 and 9.](#)

There are 600 fish in a lake.

The fish are bream, tench, perch and carp.

One-sixth of the fish are bream.

30% of the fish are tench.

The ratio of perch to carp is 5 : 3

How many perch are there?

An answer worth full marks

$$600 \times \frac{1}{6} = 100 \text{ bream}$$

$$0.3 \times 600 = 180 \text{ tench}$$

$$600 - 100 - 180 = 320$$

$$\frac{320}{8} = 40$$

$$40 \times 5 = 200 \text{ perch}$$

Answer 200

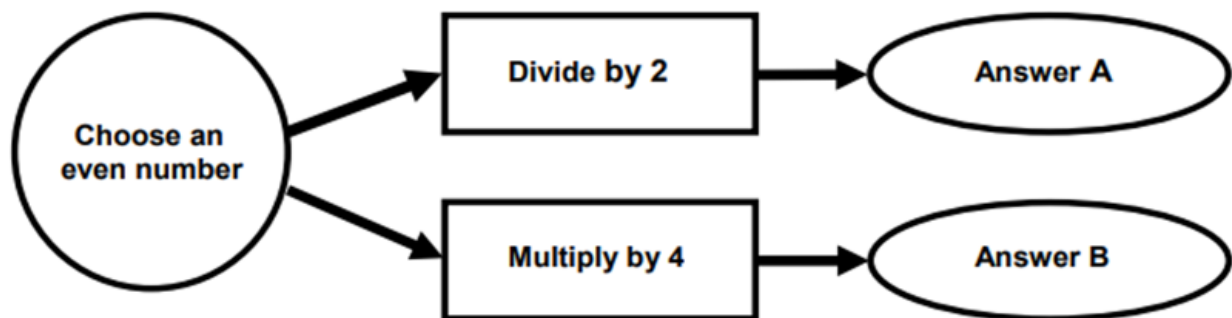
90 maths problem solving questions

This supports the problem solving requirement (AO3) of GCSE Mathematics. Very useful summary lists link questions to process skills and to content areas. Full commentaries are given on 30 of the problems.

[GCSE Mathematics: 90 maths problem solving questions.](#)

Flow Chart

Here is a flow chart.



Explain why $(B - A)$ is always a multiple of 7

GCSE examination questions

[AQA GCSE Assessment Resources](#)

[AQA legacy GCSE question papers](#)

Put the numbers 2, 4, 5 and 9 in the boxes to make the fraction equal to the decimal.

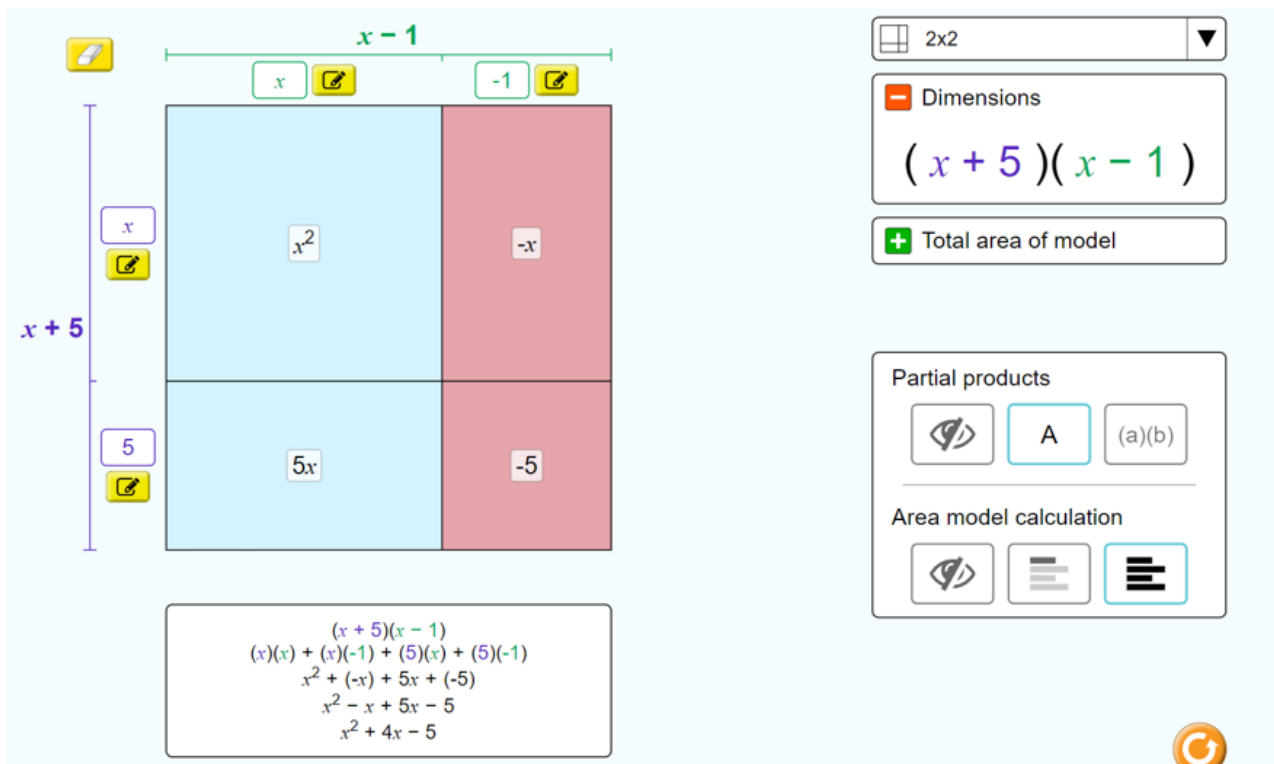
$$\frac{\square}{\square} = \square . \square$$

(1)

PhET interactive simulations

PhET Interactive Simulations, University of Colorado, Boulder is a collection of interactive, research-based science and mathematics simulations.

All simulations available at <https://phet.colorado.edu> are open educational resources available under the Creative Commons Attribution license ([CC-BY](https://creativecommons.org/licenses/by/4.0/)).



The simulation displays a 2x2 grid of rectangles representing the multiplication of $(x+5)(x-1)$. The top-left rectangle is light blue and labeled x^2 . The top-right rectangle is light red and labeled $-x$. The bottom-left rectangle is light blue and labeled $5x$. The bottom-right rectangle is light red and labeled -5 . The total area of the model is calculated as $x^2 + 4x - 5$.

Dimensions: $(x+5)(x-1)$

Total area of model: $x^2 + 4x - 5$

Partial products: $(x)(x)$, $(x)(-1)$, $(5)(x)$, $(5)(-1)$

Area model calculation: $x^2 + (-x) + 5x + (-5)$, $x^2 - x + 5x - 5$, $x^2 + 4x - 5$

PhET Sims, Area Model Algebra

Transum mathematics

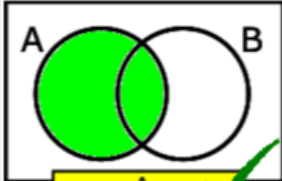
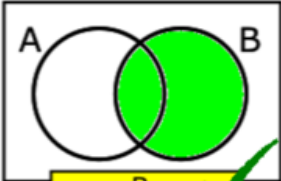
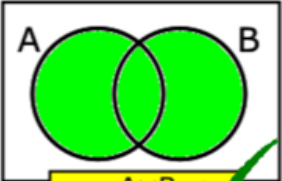
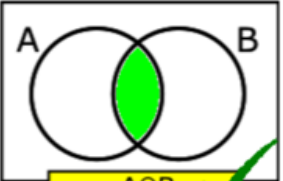
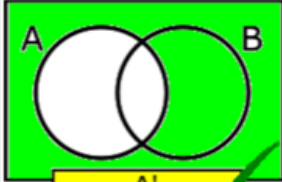
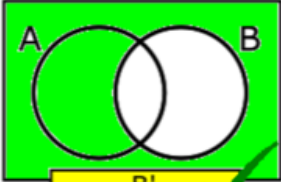
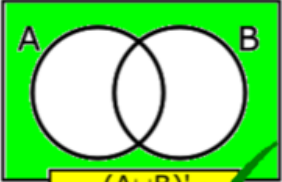
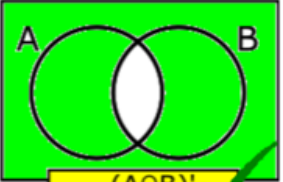
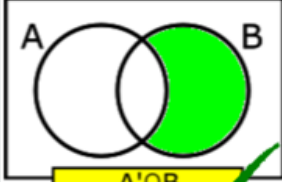
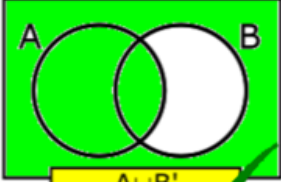
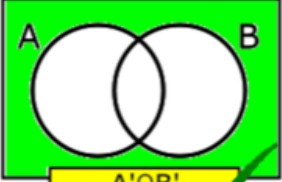
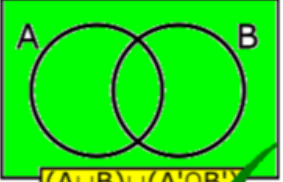
From John Tranter, Transum Mathematics is an extensive collection of excellent resources, including many which are useful for student self-study as answers can be checked.

[Transum Mathematics](#). See the [Mathematics Curriculum](#) section for suggested resources for Key Stage 4. Learners can use the [Maths Map](#) to help find topics.

Venn Paint

Transum Mathematics

Venn Diagram
Level 1
Level 2
Level 3
Exam Questions

 A ✓	 B ✓	 $A \cup B$ ✓	 $A \cap B$ ✓
 A' ✓	 B' ✓	 $(A \cup B)'$ ✓	 $(A \cap B)'$ ✓
 $A' \cap B$ ✓	 $A \cup B'$ ✓	 $A' \cap B'$ ✓	 $(A \cup B) \cup (A' \cap B)'$ ✓

Claim your Trophy for 12 out of 12

www.transum.org

Building blocks resources

These resources start with basic questions and progress to more challenging GCSE type questions. This example on functions goes from simple function machines through to composite functions. A resource like this helps teachers consider the small steps for a topic.

From Andy Lutwyche on TES, [Building Blocks resources](#)

BUILDING BLOCKS

$f(x) = 2x + 9$ $g(x) = 4 - 3x$ Solve $f(x) = g(x)$	$f(x) = x^2 - 5$ $g(x) = \frac{3x - 2}{5}$ Find $gf(3)$	$f(x) = x^2 + 4$ $g(x) = 2x - 1$ Find $fg(x)$	
Given that $h(x) = \frac{x^2}{x+2}$, calculate $h(-4)$	Given that $g(x) = \frac{3x-4}{2x}$, find $g(x) = 2$	Given that $f(x) = \frac{5}{x-2}$, what value of x must be excluded from the domain of $f(x)$?	Given that $g(x) = 3x^2 - 2$, find $g^{-1}(x)$

FOR FUNCTIONS

Substitute $x = -3$ into $2x^2 - 5$	Make x the subject of $y = \frac{4x+1}{3}$	Make q the subject of $p = \frac{3q}{q-2}$
-------------------------------------	----------------------------------------------	----------------------------------------------

What is the output if the input is 4? In \rightarrow $\times 3$ \rightarrow -1 \rightarrow Out	What is the input if the output is 36? In \rightarrow $+5$ \rightarrow $\times 2$ \rightarrow Out	What is the output if the input is x ? In \rightarrow $\times 5$ \rightarrow $+2$ \rightarrow Out	What is the input if the output is y ? In \rightarrow $\times 4$ \rightarrow -3 \rightarrow Out
-----------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------

Also from Andy Lutwyche, see his [Clumsy Clive resources](#) where students must identify and correct the errors Clive has made in his homework and his [What was the question?](#) series which provide sets of four questions that have the same answer; students must provide the missing information in the questions.

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Contact us

Our friendly team will be happy to support you between 8am and 5pm, Monday to Friday.

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