



FluidMaths

GCSE Mathematics (Grade 9-1)

Problem Solving
Functions
Questions

The marks shown are for guidance purposes only

When not specified, round all non-terminating decimals during your calculations to 3 significant figures

Some useful strategies in problem-solving

- Read the question carefully
- Sketch a diagram where applicable
- Take note of key information
- Write down any formulae you may need
- Tackle the problem in bite-size rather than as a whole
- Concentrate on the part of the problem you understand and start from there
- Collaborate with a partner and share ideas
- Use a dictionary to find the meaning of any confusing words
- Check that your answers make sense in the context of the question

<p>1</p>	<p>Here are three functions $f(x) = 2ax + b$; $g(x) = 4x^2 - 12x - 7$ and $h(x) = 2x + 1$ Given that $\frac{g(x)}{h(x)} = f(x)$, find the values of a and b.</p> <p style="text-align: right;">[4marks]</p>
<p>2</p>	<p>Two functions are such that $g(x) = 20 - kx$; and $h(x) = -3k - 7$ Given that $gh(x) = 33$ find the possible values of k. Give your answers to 2 decimal places.</p> <p style="text-align: right;">[5marks]</p>
<p>3</p>	<p>The equation of a quadratic function is given as $f(x) = k(x + b)^2 + c$ The minimum point of the function is $(1, -7)$ The y-intercept of the function is $(0, -5)$</p> <p>a) Find the values of k, b and c. [4marks]</p> <p>b) Hence write $f(x)$ in the form $f(x) = ax^2 + bx + c$ [2marks]</p>
<p>4</p>	<p>A function is defined as $f(x) = ax^2 + 6x + c$ A graph of the function passes through $(-8, 15)$ and $(0, -1)$ Write $f(x)$ in the form $(x + p)^2 + q$, Stating the values of p and q</p> <p style="text-align: right;">[5marks]</p>

Functions Questions

5	Given that $f^{-1}(x) = \frac{x+2}{3}$, Solve $f(x) = -1$ [4marks]
6	Given that, $f(x) = 5x + 3$ Solve $f^{-1}f(x) = 7 - 3x$. [5marks]
7	Here are two functions: $g(x) = 3x^2$ and $h(x) = kx - 7$ Given that $hg(x) = 17$, find k in terms of x . [3marks]
8	Two functions are such that $f(x) = 13 - 4x$ and $g(x) = ax + 5$ Given that $fg(x) = 10x - 7$, find the value of a . [4marks]