



FluidMaths

GCSE Mathematics (Grade 9-1)

Problem Solving

Simultaneous Equations Set 2

(Linear and Quadratic)

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

1	<p>The sum of two numbers is 6 The sum of the squares of the two numbers is 90 Calculate the possible values of the two numbers</p>	[5marks]
2	<p>Given that $(x + y)^2 = 144$ and $(x - y)^2 = 81$, find the ratio of $x : y$ in its simplest form.</p>	[6marks]
3	<p>Given that $x : y = 3 : 5$ and $3x + y = -21$, Find the exact values of x and y</p>	[5marks]
4	<p>Solve the equations $(x + y)^3 = -27$ and $(x - y)^2 = 169$</p>	[5marks]
5	<p>x and y are real numbers The sum of x and the reciprocal of y is 10 The difference between x and y is 4 Find the possible values of x and y Give your answers to 3 significant figures</p>	[6marks]
6	<p>The equation of a curve is given as $y^2 + x^2 = 4$ The equation of a straight line is given as $y = 3x + k$</p> <p>a) Show that $10x^2 + k^2 + 6xk - 4 = 0$ [3marks]</p> <p>b) Given that the line and the curve intersect at $(-1.2, q)$, where $q > 0$. Find the values of q and k [4marks]</p>	

<p>7</p>	<p>Given that $y = x + k$ and $y = -x^2 + 2k$</p> <p>a) Show that $x^2 + x - k = 0$ [2marks]</p> <p>b) The point $A = (1, 3)$ is on the curve. Find the value of k [2marks]</p> <p>c) Hence find the points where the line and curve intersect [5marks]</p>
<p>8</p>	<p>Given that $x^2 + y^2 - 50 = 0$ and $y = 2x + k$</p> <p>a) Show that $5x^2 + 4xk + k^2 = 50$ [3marks]</p> <p>b) Find the possible values of k when $x = 1$ [3marks]</p>