FluidMaths

GCSE Mathematics (Grade 9-1)

Problem Solving
Quadratic Equations Set 1
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

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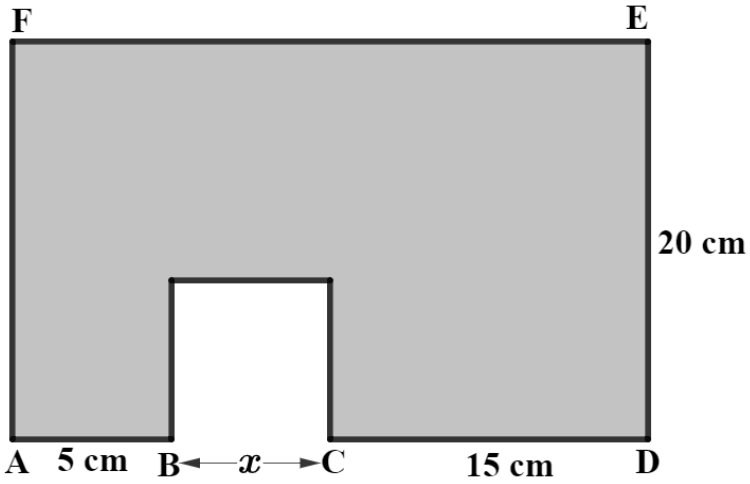
1 ADEF is a rectangle
A square of side x is removed from the rectangle as shown



AB = 5 cm
BC = x
CD = 15 cm
DE = 20 cm
If the shaded area is 484 cm^2,
show that there are two possible values of x

[5marks]

2 The sum of a number and its reciprocal is 10
Find the possible values of the number
Give your answers to 1 decimal place.

[4marks]

3 The equation of a quadratic function is given as

$$y = k(x + b)^2 + c$$

The minimum point of the function is $(1, -7)$
The y-intercept of the function is $(0, -5)$
Find the values of k, b and c.

[4marks]

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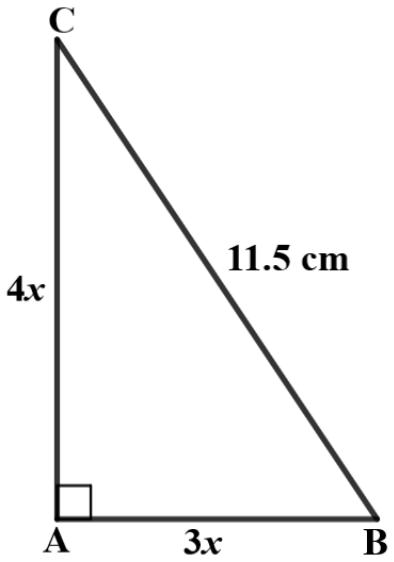
4 ABC is a right-angled triangle



$AB = 3x$
$AC = 4x$
$BC = 11.5$ cm
Calculate the value of x to 1 decimal place

[4marks]

5 A function is given by $f(x) = ax^2 + 6x + c$
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

[5marks]

6 Given that $1 : 2y = y : 24$,
Find the possible values of y
Give your answer as a simplified surd.

[4marks]

7 A quadratic function $f(x)$ is such that $f(x) = (x + p)^2 + q$
The minimum point of $f(x)$ is$(-2, -5)$
Find the equation of $f(x)$ in the form $x^2 + bx + c$

[4marks]

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8	Given that $5: 6y = 3y : 8$, Show that $y = \frac{2\sqrt{5}}{3}$ **[3marks]**
9	Given that $4x^2 - 11xy + 6y^2 = 0$, find the two possible equations of y in terms of x **[4marks]**

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