

FluidMaths

GCSE Mathematics (Grade 9-1)

Problem Solving
Linear Inequalities
Questions

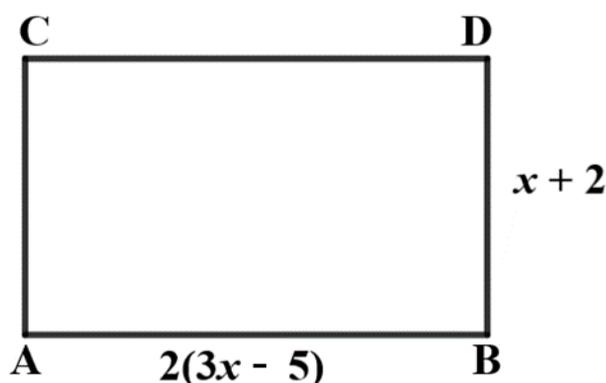
The marks shown are for guidance purposes only

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 ABCD is a rectangle
All measurements are in centimeters.



$$AB = 2(3x - 5)$$

$$BD = x + 2$$

Where x is an integer

Given that AB is longer than AC,

find the smallest possible area of the rectangle.

[5marks]

- 2 Here are the charges for two taxi companies

Company A	Company B
£15 + £6 per hour	£25 + £4 per hour

Oscar wants to hire a taxi for some hours.

What is the least number of hours that makes it better to hire from Company B?

[3marks]

- 3 Ben is a car valet.

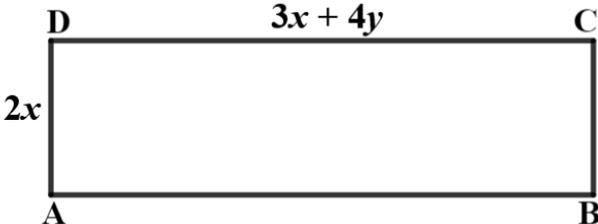
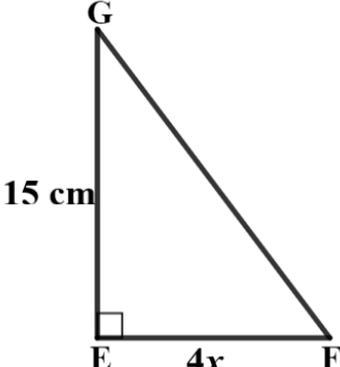
He charges £25 per valet

Ben spends £65 a day to pay for his expenses.

Ben wants to make a daily profit of at least £135 but not more than £185.

How many cars should Ben aim to valet a day?

[3marks]

4	<p>Given that $x:y = 2:3$ and $6x + 21y < 70$, Find the largest integer value of y.</p> <p style="text-align: right;">[4marks]</p>
5	<p>ABCD is a rectangle EFG is a triangle</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p> $AD = 2x$ $CD = 3x + 4y$ $EF = 4x$ $EG = 15 \text{ cm}$ </p> <p>The area of the triangle is 60 cm^2. The perimeter of the rectangle is known to be larger than the perimeter of the triangle.</p> <p>What is the least integer value of y?</p> <p style="text-align: right;">[6marks]</p>
6	<p>Given that $3x\sqrt{5} + \sqrt{12} \geq x\sqrt{125}$, prove that $x \geq \frac{\sqrt{15}}{5}$</p> <p style="text-align: right;">[4marks]</p>
7	<p>Solve the inequality below</p> $3^4 \leq 3^{5-2x} \leq 243,$ <p style="text-align: right;">[4marks]</p>
8	<p>Given that $5^{8x} \leq 125^{y-5}$ and $27^x = \frac{1}{81}$ Calculate the least integer value of y</p> <p style="text-align: right;">[6marks]</p>