

An estimate of the height, H metres, of a tall building can be found using the formula

$$H = 4f + 12$$

where the building is f floors high.

A tall building is **110 floors** high.
The real height of the building is **442 m**.

Seb uses the formula to find an estimate of the height of this building.
He then finds the difference between his estimate and the real height.

Show that this difference is **less than 5%** of the real height.

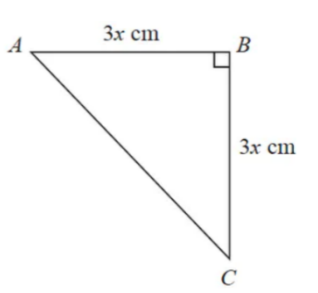
4 marks

The n th term of a sequence is $2n^2 - 1$.
The n th term of a different sequence is $40 - n^2$.

Show that there is only **one number** that is in both of these sequences.

3 marks

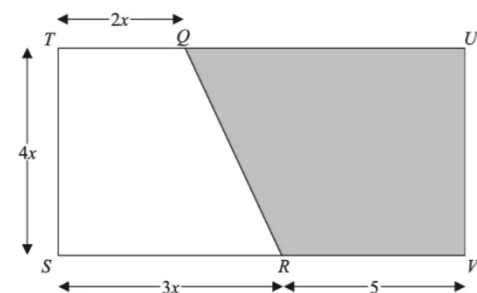
ABC is an isosceles right-angled triangle.



The area of the triangle is **162 cm²**.
Work out the value of x .

3 marks

The diagram shows rectangle $STUV$.
 TQU and SRV are straight lines.
All measurements are in cm.



The area of trapezium $QUVR$ is $A \text{ cm}^2$.
Show that $A = 2x^2 + 20x$.

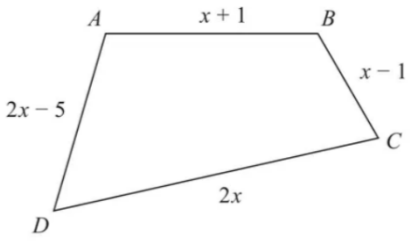
3 marks

Solve

$$\frac{5 - x}{2} = 2x - 7$$

3 marks

Here is a quadrilateral $ABCD$.



All the measurements are in centimetres.
The perimeter of $ABCD$ is **52 centimetres**.
Work out the length of DC .

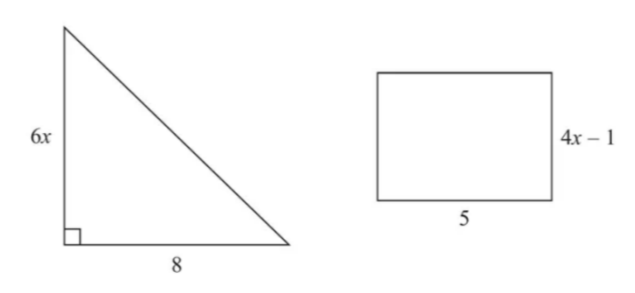
4 marks

Kiaria is **7 years older** than Jay.
Martha is **twice as old** as Kiaria.
The sum of their three ages is **77**.

Find the ratio of Jay's age to Kiaria's age to Martha's age.

4 marks

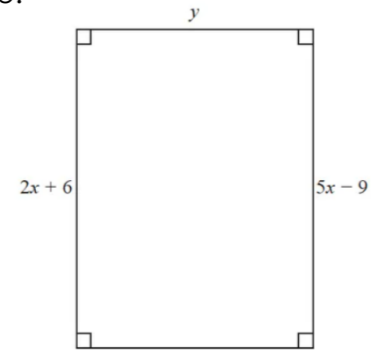
Here is a triangle and a rectangle.



All measurements are in centimetres.
The area of the triangle is **10 cm² greater** than the area of the rectangle.
Work out the value of x .

4 marks

Here is a rectangle.



All measurements are in centimetres.
The area of the rectangle is **48 cm²**.
Show that $y = 3$.

4 marks

