

Activity 1**A Level**

Rank these questions in order of increasing demand (1 = least demand)

A Prove the Remainder Theorem for linear factors of a polynomial.

B $f(x) = \ln(x + \sqrt{1 + x^2})$.

Find $f'(x)$ giving your answer in its simplest form.

C The curve C has equation $y = \frac{1}{8}x^3 - \frac{24}{\sqrt{x}} + 1$

Find $\frac{dy}{dx}$, giving the answer in its simplest form.

D Solve the equation

$$4x = 2\sqrt{2}x + 20\sqrt{2}$$

giving your answer in the form $p + q\sqrt{2}$ where p and q are rational numbers.

You must show each stage of your working.

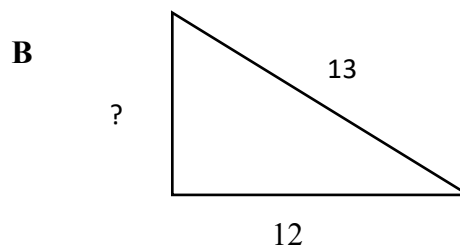
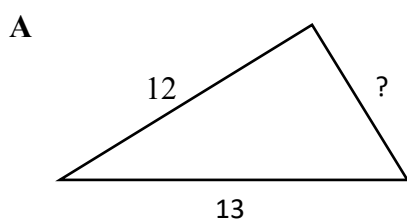
E The circle C has equation $x^2 + y^2 = 8x - 10y$

Find the coordinates of the centre of C and find the radius of C

F Given that $(x - a)^2$ is a factor of the polynomial $P(x)$, show that $P(a) = P'(a) = 0$

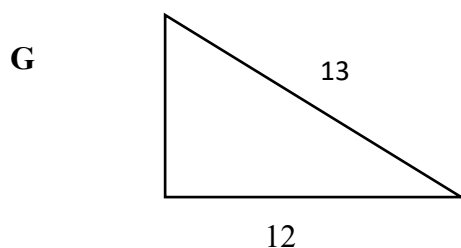
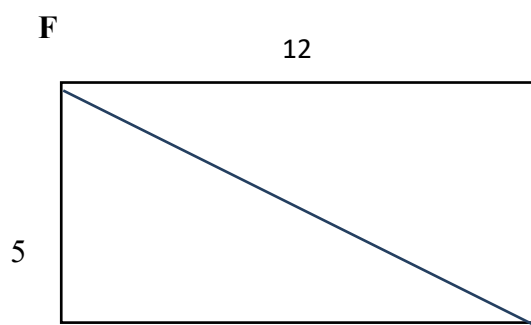
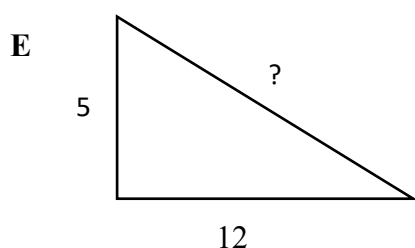
Activity 1

Put these questions, based on Pythagoras, in order of increasing demand.



C A rectangle has sides of length 5 cm and 12 cm. Find the length of a diagonal.

D Starting from home, Kareem walks 5 km East and then turns and walks 12 km South to his cousin's house. How far is his cousin's house from Kareem's home?



Find the area of this triangle.

H Is there a unique right-angled triangle which satisfies both of the following conditions?

It has an area of 30

It has a perimeter of 30