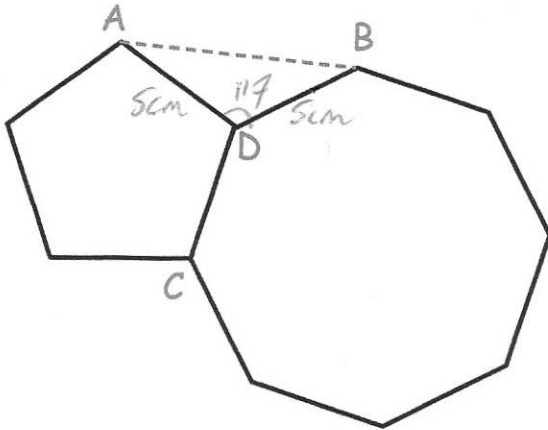


5th June



Corbettmaths

A is a vertex of a regular pentagon.
B is a vertex of a regular octagon.
C and D are vertices of both polygons.



The perimeter of the octagon is 40cm.
Work out the length AB

$$AB^2 = 5^2 + 5^2 - 2 \times 5 \times 5 \times \cos 117$$

$$8.526 \text{ cm}$$

Prove that when two consecutive integers are squared, that the difference is equal to the sum of the two consecutive integers.

~~$$(n+1)^2 - n^2 = 2n + 1$$~~

$$(n+1)^2 = n^2 + 2n + 1$$

$$n^2 + 2n + 1 - n^2 = 2n + 1$$

$$n + (n+1) = 2n + 1$$

QED

The point A has coordinates $(-6, 0)$
The point B has coordinates $(0, 3)$
The point C has coordinates $(9, -1)$

Find the equation of the line that passes through C and is perpendicular to AB.

$$\text{gradient of } AB = \frac{1}{2}$$

$$y = -2x + c$$

$$-1 = -18 + c$$

$$c = 17$$

$$y = -2x + 17$$

For all values of x

$$f(x) = 3x + 2 \quad \text{and}$$

$$g(x) = (x - 3)^2$$

Find $fg(x)$

$$fg(x) = 3(x-3)^2 + 2$$

$$= 3(x-3)(x-3) + 2$$

$$= 3(x^2 - 6x + 9) + 2$$

$$= 3x^2 - 18x + 27 + 2$$

$$= 3x^2 - 18x + 29$$