

Dr Oliver Mathematics

Worked Examples

Mensuration 3

From: IGCSE 2012 June Paper 3H Q13: Calculator

1. The diagram shows two congruent regular pentagons and part of a regular n -sided polygon **A**. (5)

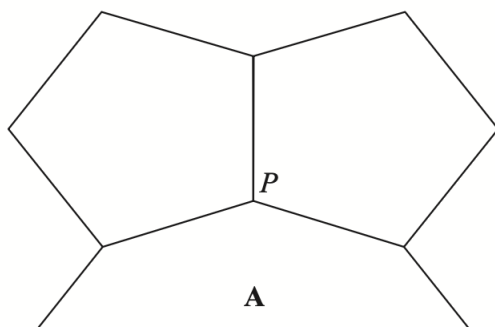


Diagram **NOT**
accurately drawn

Two sides of each of the regular pentagons and two sides of **A** meet at the point P .

Calculate the value of n .
Show your working clearly.

Solution

All pentagons have an angle

$$\frac{(5 - 2) \times 180}{5} = 108^\circ.$$

Now, there are two congruent regular pentagons and part of a regular n -sided polygon:

$$360 - 2 \times 108 = 144^\circ.$$

Now,

$$\begin{aligned} \frac{(n - 2) \times 180}{n} &= 144 \Rightarrow 180(n - 2) = 144n \\ &\Rightarrow 180n - 360 = 144n \\ &\Rightarrow 36n = 360 \\ &\Rightarrow \underline{\underline{n = 10.}} \end{aligned}$$