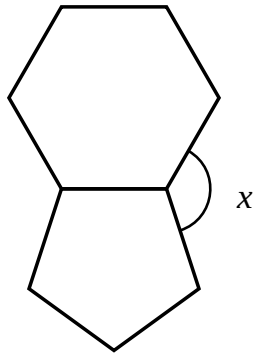
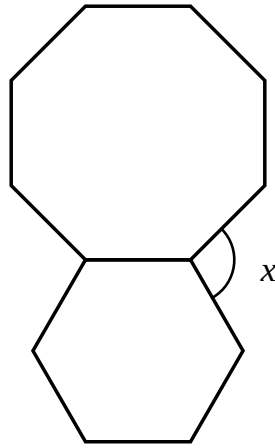


I Do

The diagram shows a regular hexagon and a regular pentagon sharing a common edge.

Work out the size of the obtuse interior angle x between the outer edges.

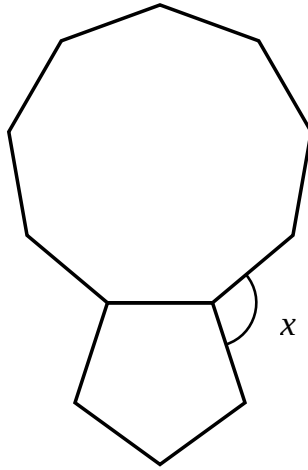
You must show all your working.

We Do

The diagram shows a regular octagon and a regular hexagon sharing a common edge.

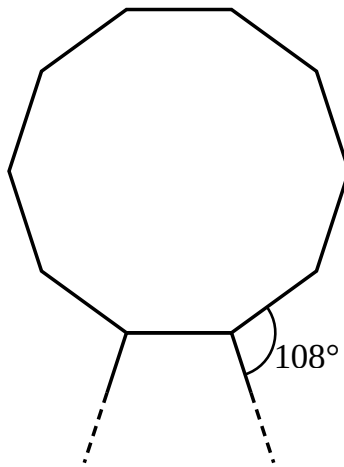
Work out the size of the angle x between the outer edges.

You must show all your working.

You Do

The diagram shows a regular nonagon (9 sides) and a regular pentagon sharing a common edge.

Work out the size of the angle x between the outer edges.
You must show all your working.

Challenge

The diagram shows a regular decagon (10 sides) and a regular polygon with n sides sharing a common edge.

The angle between their outer edges is 108° .

Work out the value of n .

You must show all your working.

Answers & Worked Solutions

- **I Do:**

Interior angle of regular hexagon = $(6 - 2) \times 180 \div 6 = 120^\circ$

Interior angle of regular pentagon = $(5 - 2) \times 180 \div 5 = 108^\circ$

Angles around a point sum to 360° .

$$x = 360 - 120 - 108 = 132^\circ$$

Answer: 132°

- **We Do:**

Interior angle of regular octagon = $(8 - 2) \times 180 \div 8 = 135^\circ$

Interior angle of regular hexagon = $(6 - 2) \times 180 \div 6 = 120^\circ$

Angles around a point sum to 360° .

$$x = 360 - 135 - 120 = 105^\circ$$

Answer: 105°

- **You Do:**

Interior angle of regular nonagon = $(9 - 2) \times 180 \div 9 = 140^\circ$

Interior angle of regular pentagon = $(5 - 2) \times 180 \div 5 = 108^\circ$

Angles around a point sum to 360° .

$$x = 360 - 140 - 108 = 112^\circ$$

Answer: 112°

- **Challenge:**

Interior angle of regular decagon = $(10 - 2) \times 180 \div 10 = 144^\circ$

Let the interior angle of the unknown polygon be y .

Angles around a point sum to 360° .

$$144 + 108 + y = 360$$

$$252 + y = 360 \rightarrow y = 108^\circ$$

Exterior angle of the unknown polygon = $180 - 108 = 72^\circ$

$$\text{Number of sides } n = 360 \div 72 = 5$$

Answer: 5 sides