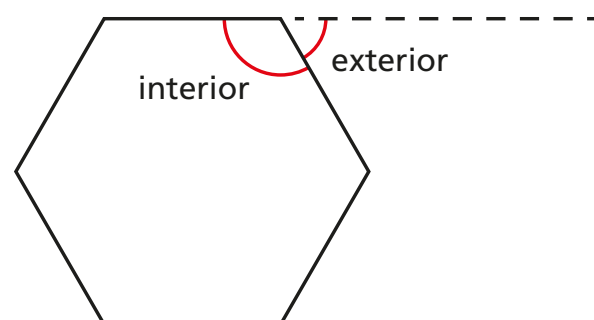


Understand and use the sum of exterior angles of any polygon

- 1 The diagram shows an interior angle of a hexagon and its adjacent exterior angle.



- a) Talk to a partner about why you think they are called interior and exterior angles.

- b) Choose from the list to complete the sentences.

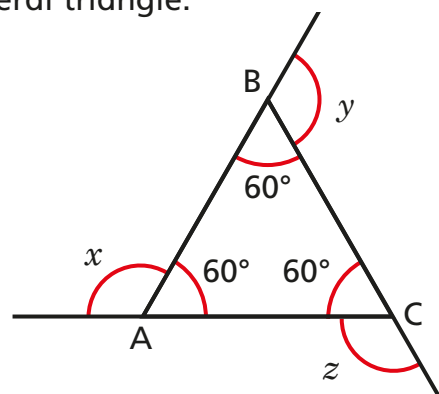
adjacent interior exterior straight sum 180°

An interior angle and its adjacent exterior angle form a straight line. Therefore they sum to 180°

- c) Complete the statement.

interior angle + exterior angle = 180°

- 2 ABC is an equilateral triangle.



- a) Explain why each of the interior angles is 60° .

- b) x , y and z are the exterior angles of triangle ABC.

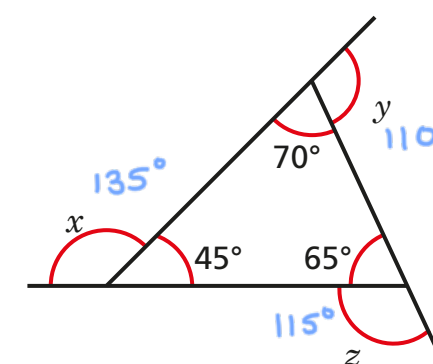
Work out the sizes of these angles.

$$x = 120^\circ \quad y = 120^\circ \quad z = 120^\circ$$

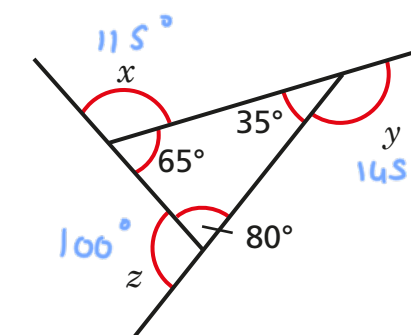
- c) Complete the calculation.

$$x + y + z = 360^\circ$$

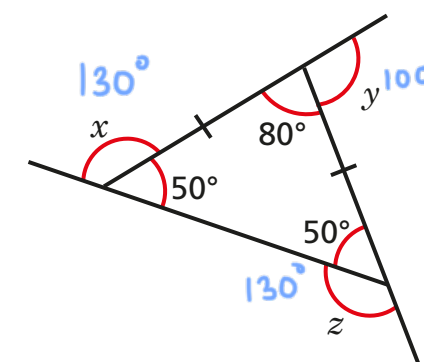
- d) Work out the exterior angles of each triangle. Label them on the diagram and complete the calculations.



$$x + y + z = 360^\circ$$



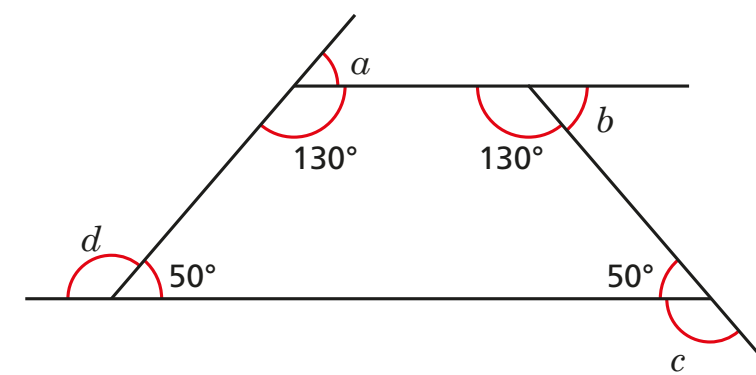
$$x + y + z = 360^\circ$$



$$x + y + z = 360^\circ$$

- 3 Work out the size of the exterior angle of each polygon. Then work out the sum of the exterior angles.

- a)



$$a + b + c + d = 360^\circ$$

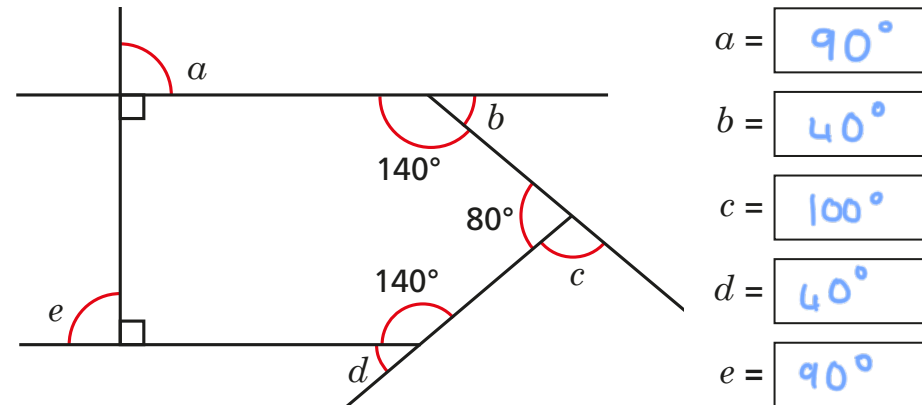
$$a = 50^\circ$$

$$b = 50^\circ$$

$$c = 130^\circ$$

$$d = 130^\circ$$

b)



$$a + b + c + d + e = 360^\circ$$

What do you notice?

4

Complete the sentence.

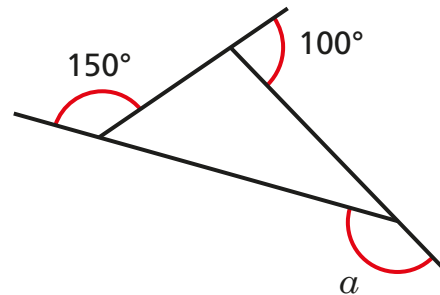
The sum of the exterior angles of any polygon is 360°

5

Work out the sizes of the unknown angles.

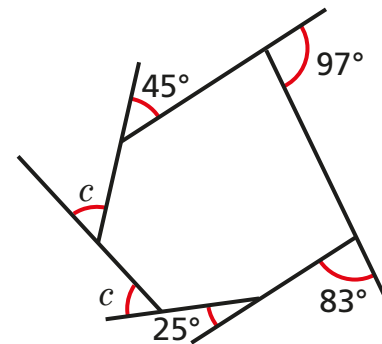
Find the unknown sides and angles.

a)



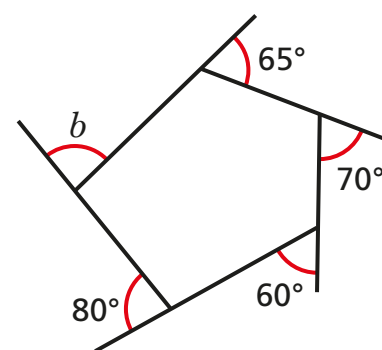
$$a = 110^\circ$$

c)



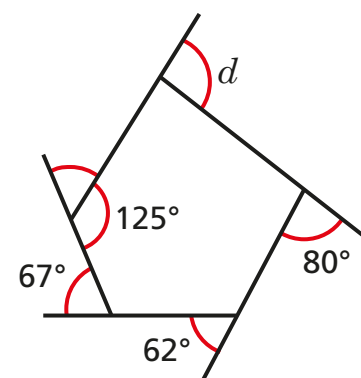
$$c = 55^\circ$$

b)



$$b = 85^\circ$$

d)



$$d = 96^\circ$$

6

Work out the size of the exterior angles of regular polygons with the given number of sides.

a) 3 sides

c) 5 sides

e) 10 sides

$$120^\circ$$

$$72^\circ$$

$$36^\circ$$

b) 4 sides

d) 6 sides

f) 36 sides

$$90^\circ$$

$$60^\circ$$

$$10^\circ$$

7

A regular polygon has n sides.

a) Write an expression for the size of each exterior angle.

$$\frac{360}{n}$$

b) Write an expression for the size of each interior angle.

$$180 - \frac{360}{n}$$

8

A regular polygon has an exterior angle of 30° .
How many sides does the polygon have?

$$12$$

