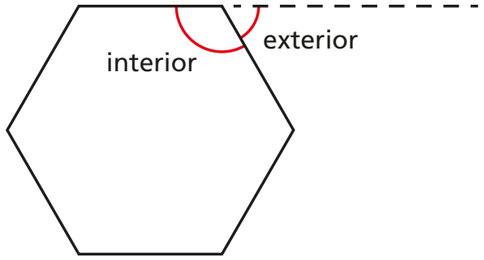
Understand and use the sum of exterior angles of any polygon

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 _____ angle and its _____ _____

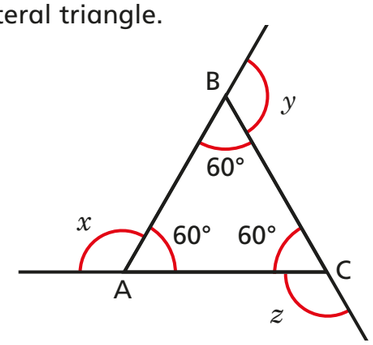
angle form a _____ line. Therefore they _____

to _____

c) Complete the statement.

interior angle + exterior angle = ☐

2 ABC is an equilateral triangle.



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

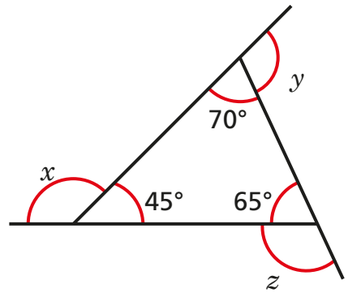
b) x, y and z are the exterior angles of triangle ABC.

Work out the sizes of these angles.

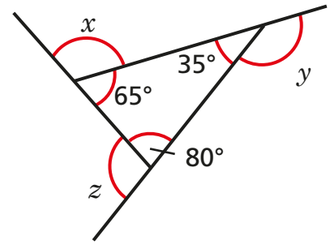
$x =$ ☐ $y =$ ☐ $z =$ ☐

c) Complete the calculation. $x + y + z =$ ☐

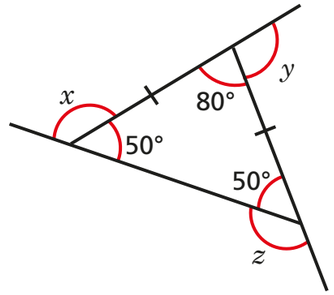
d) Work out the exterior angles of each triangle. Label them on the diagram and complete the calculations.



$x + y + z =$ ☐



$x + y + z =$ ☐

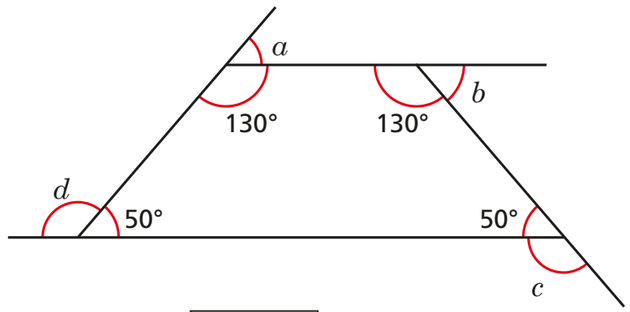


$x + y + z =$ ☐

3 Work out the size of the exterior angle of each polygon.

Then work out the sum of the exterior angles.

a)



$a =$ ☐

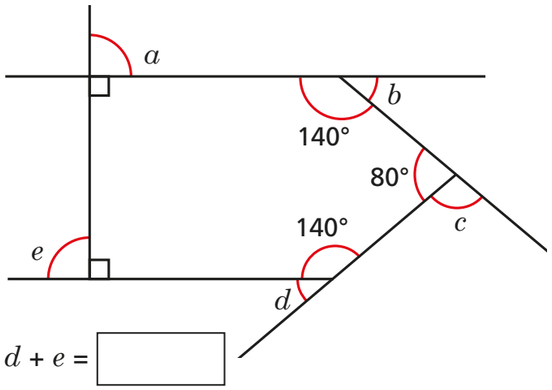
$b =$ ☐

$c =$ ☐

$d =$ ☐

$a + b + c + d =$ ☐

b)



$a =$ ☐

$b =$ ☐

$c =$ ☐

$d =$ ☐

$e =$ ☐

$a + b + c + d + e =$ ☐

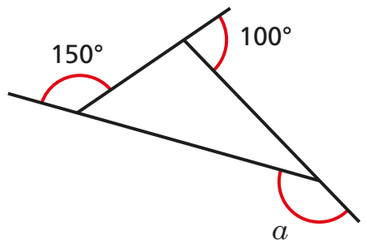
What do you notice?

4 Complete the sentence.

The sum of the exterior angles of any polygon is ☐

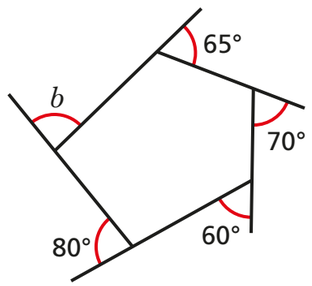
5 Work out the sizes of the unknown angles.

a)



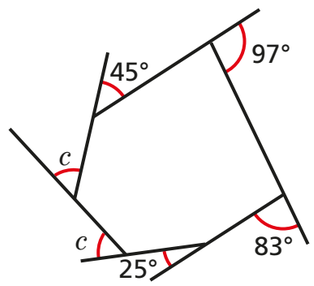
$a =$ ☐

b)



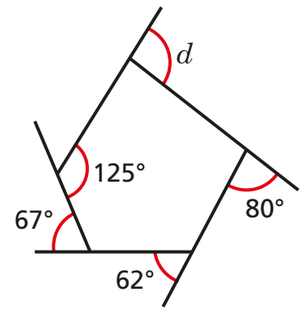
$b =$ ☐

c)



$c =$ ☐

d)



$d =$ ☐

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

a) 3 sides ☐

b) 4 sides ☐

c) 5 sides ☐

d) 6 sides ☐

e) 10 sides ☐

f) 36 sides ☐

7 A regular polygon has n sides.

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

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

8 A regular polygon has an exterior angle of 30°.

How many sides does the polygon have?

☐