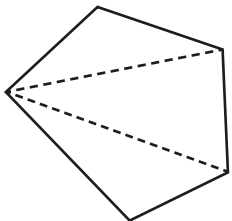


Angles in regular polygons

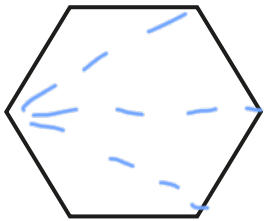
1 The sum of the interior angles of a triangle is 180° .

Split the polygons into triangles to work out the sum of their interior angles. Your lines should not overlap.

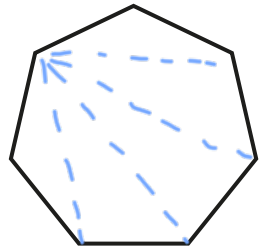
The first one has been done for you.

a)  number of sides = 5
number of triangles = 3
 $3 \times 180 = 540$

The sum of the interior angles of a pentagon is 540°

b)  number of sides = 6
number of triangles = 4
 $4 \times 180 = 720$

The sum of the interior angles of a hexagon is 720°

c)  number of sides = 7
number of triangles = 5
 $5 \times 180 = 900$

The sum of the interior angles of a heptagon is 900°

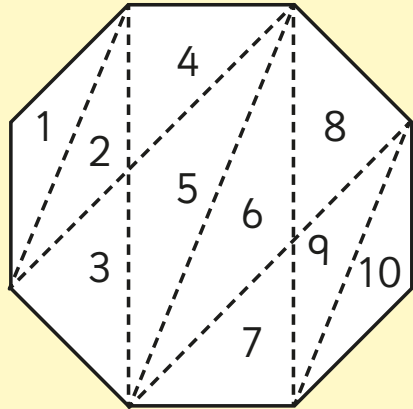
What do you notice about the number of sides compared to the number of triangles?

2 Complete the table.

Shape	Number of sides	Number of triangles	Sum of interior angles
quadrilateral	4	2	360°
pentagon	5	3	540°
nonagon	9	7	$1,260^\circ$
decagon	10	8	$1,440^\circ$
hexagon	6	4	720°
octagon	8	6	$1,080^\circ$
dodecagon	12	10	$1,800^\circ$

Compare answers with a partner.

3 Dani is working out the sum of the interior angles of a polygon. Here are her workings.



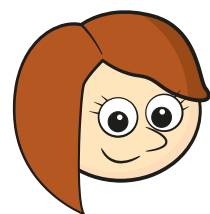
$10 \times 180 = 1,800^\circ$

Do you agree with Dani? No

Explain your answer.

- 4 Rosie, Amir and Eva are drawing polygons.

a)



Rosie

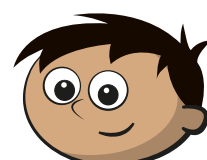
I have split my polygon into four triangles.

What polygon has Rosie drawn?

hexagon

b)

The sum of the interior angles of my polygon is $1,080^\circ$.

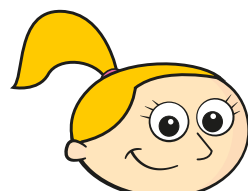


Amir

What polygon has Amir drawn?

octagon

c)



Eva

My polygon has more sides than Rosie's but fewer than Amir's.

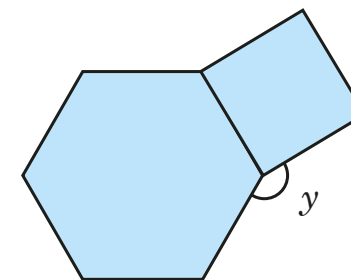
What is the sum of the interior angles of Eva's polygon?

900°



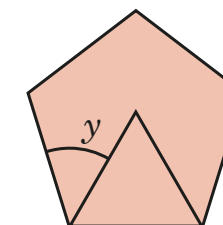
- 5 Each compound shape is made up of regular polygons. Work out angle y in each case.

a)



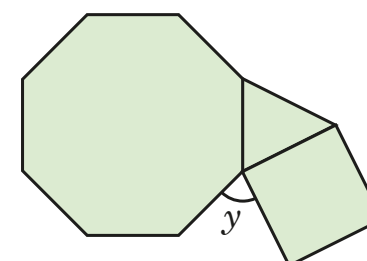
$$y = \boxed{150^\circ}$$

c)



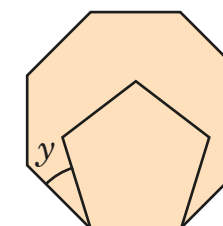
$$y = \boxed{48^\circ}$$

b)



$$y = \boxed{75^\circ}$$

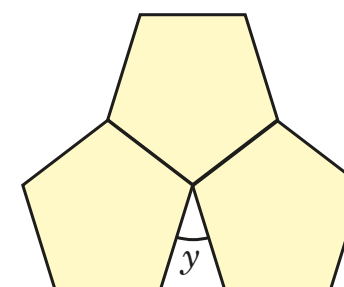
d)



$$y = \boxed{27^\circ}$$

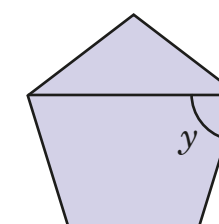
- 6 The pentagons shown are regular. Work out the size of angle y in each case.

a)



$$y = \boxed{36^\circ}$$

b)



$$y = \boxed{72^\circ}$$

