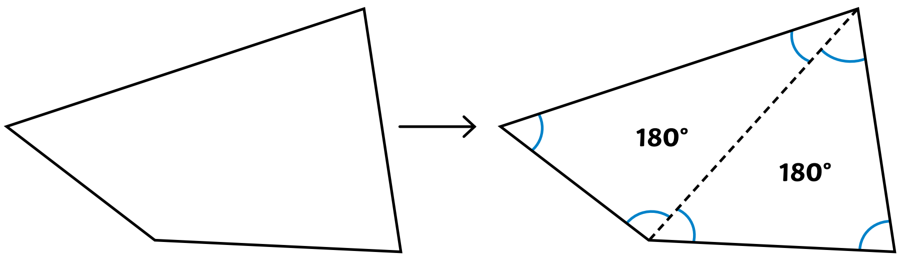
Shapes not to scale.

1) This quadrilateral has been partitioned into two triangles in order to calculate the total of the angles inside the shape.



The sum of the angles in a triangle is 180°.

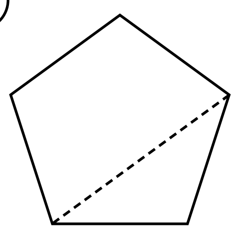
Use this fact in order to complete the statements below.

A quadrilateral can be partitioned into 2 triangles.

2 × 180° = ______________ interior angles of a quadrilateral = ______________

2) Complete the partitioning of these regular polygons into different triangles by drawing a line or lines from a single vertex. Then, find the sum of the angles inside each shape.

a)

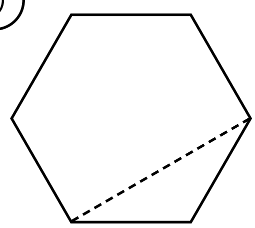


A pentagon can be partitioned into ______ triangles.

______ × 180° = ______

interior angles of a pentagon = ______________

b)

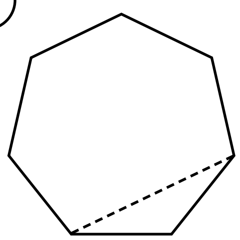


A hexagon can be partitioned into ______ triangles.

______ × 180° = ______

interior angles of a hexagon = ______________

c)

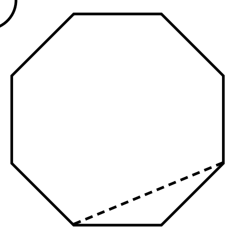


A heptagon can be partitioned into ______ triangles.

______ × 180° = ______

interior angles of a heptagon = ______________

d)



An octagon can be partitioned into ______ triangles.

______ × 180° = ______

interior angles of an octagon = ______________

3) A nonagon is the name of a 9-sided shape. Can you predict the sum of the interior angles of a nonagon?

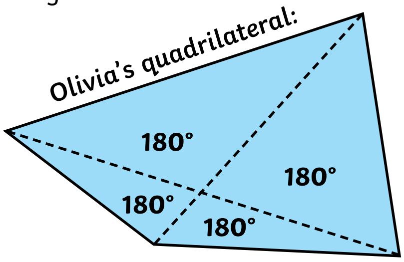
____

Shapes not to scale.

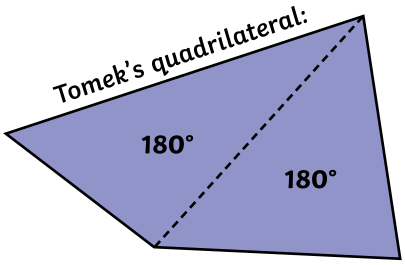
1) Is this statement always, sometimes or never true? Explain your answer and give examples to prove your thinking.

To find the sum of the interior angles of any polygon, multiply the number of sides by 180°.

Olivia and Tomek have partitioned the same quadrilateral into triangles in order to find the sum of the interior angles.



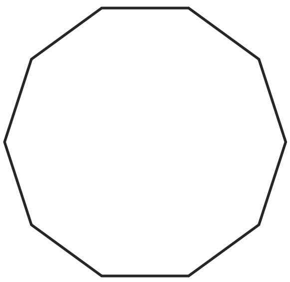
The sum of the interior angles measure 720°.



I found the sum of the interior angles measures 360°.

Who is incorrect? Explain their mistake.

2) Jia and Gethin are predicting the sum of the interior angles of this decagon (a 10-sided shape).



Jia

"I think that the sum of the interior angles in a regular decagon would be 1440° because there would be 8 triangles in the shape."

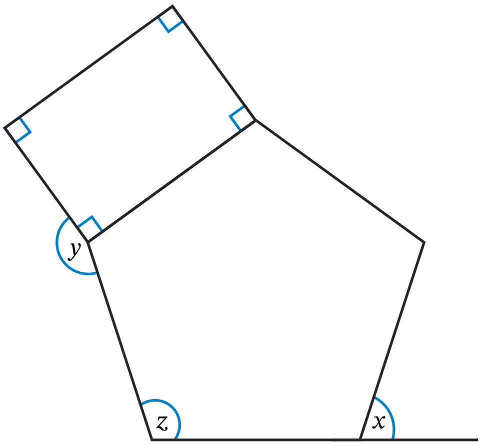
Gathin

"I disagree, I think that a decagon would actually have 7 triangles in it, therefore the sum of the interior angles would actually be 1260°."

Which child is correct? Prove it.

Shapes not to scale.

1) This shape has been made from joining together a regular pentagon and a rectangle. Calculate angles x, y and z.



y = ____________

z = ____________

x = ____________

2) What shape am I?

The sum of my interior angles has my number of sides as one of the digits.

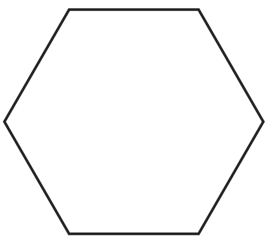
When I am partitioned into triangles, I have 6 triangles inside me.

I am a regular polygon.

3)

I think I've found a quick way to work out the sum of the interior angles in any polygon.

- Firstly, take the number of sides the polygon has.
- Next, subtract 2 from that number.
- Finally, multiply that number by 180.



A hexagon has got 6 sides, so I did this calculation:

6 - 2 = 4

4 × 180° = 720°

I think the sum of the interior angles of a hexagon is 720°.

Is Anna correct in her thinking? Does this strategy work with other polygons? Are there any it doesn't work for?

Investigate Anna's strategy by partitioning polygons into triangles. Then, calculate the sum of the angles in that shape.