

# Finding the Sum of Interior Angles in a Polygon

Maths

Miss Davies

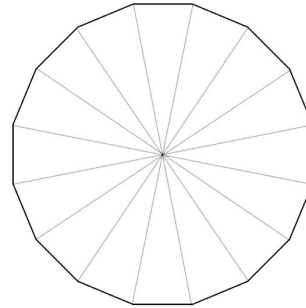


# Finding the Sum of Interior Angles in a Polygon

1. Complete the table.

Shape	Number of sides	Number of triangles	Sum of Interior angles
Quadrilateral	4	2	$360^\circ$
Pentagon			
Nonagon			
		8	
	6		
		6	
			$1800^\circ$
	20		

2. Nick is working out the sum of interior angles of a 16 sided shape.



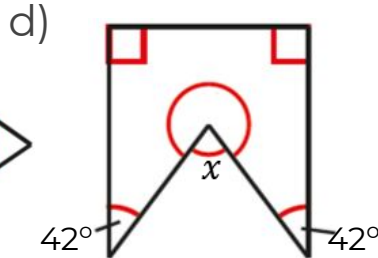
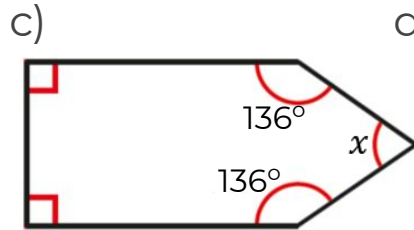
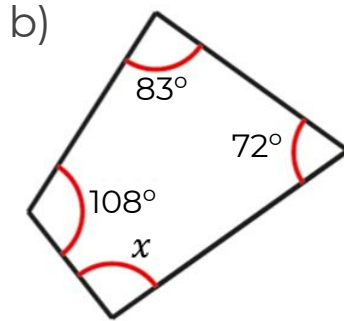
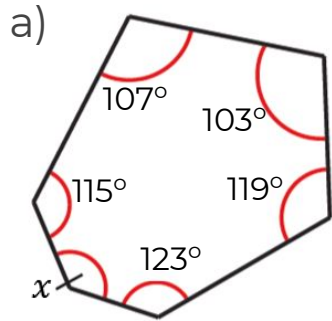
"I've split the shape into 16 triangles"  
 $16 \times 180 = 2880$   
The interior angles add up to  $2880^\circ$ .

Nick is wrong.  
What mistake has he made?



# Finding the Sum of Interior Angles in a Polygon

3. Find the angle labelled  $x$ .



4. A polygon has  $n$  sides

a) Write an expression, in terms of  $n$ , to represent the number of triangles inside the polygon.

b) Write an expression, in terms of  $n$ , to represent the sum of interior angles of the polygon.

5. Calculate the size of each interior angle in a regular hexagon.



# Answers

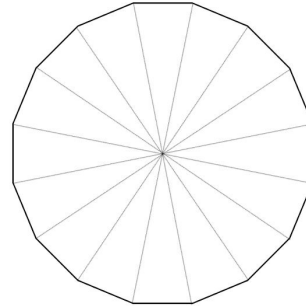


# Finding the Sum of Interior Angles in a Polygon

1. Complete the table.

Shape	Number of sides	Number of triangles	Sum of Interior angles
Quadrilateral	4	2	$360^\circ$
Pentagon	5	3	$540^\circ$
Nonagon	9	7	$1260^\circ$
Decagon	10	8	$1440^\circ$
Hexagon	6	4	$720^\circ$
Octagon	8	6	$1080^\circ$
Dodecagon	12	10	$1800^\circ$
Icosagon	20	18	$3240^\circ$

2. Nick is working out the sum of interior angles of a 16 sided shape.



"I've split the shape into 16 triangles"  
 $16 \times 180 = 2880$   
The interior angles add up to  $2880^\circ$ .

Nick is wrong.

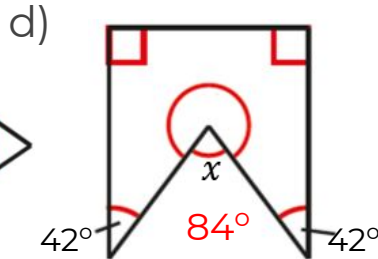
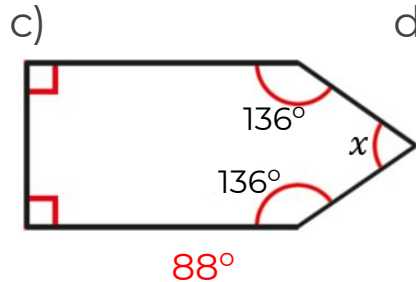
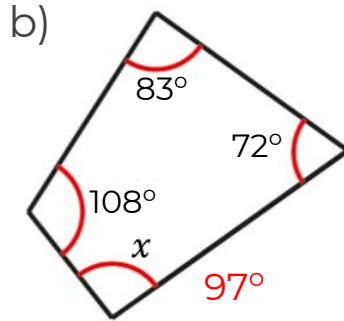
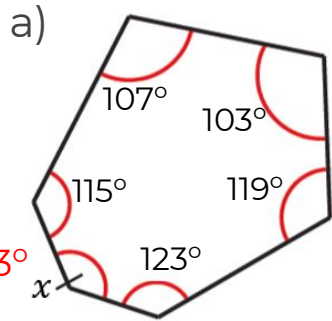
What mistake has he made?

He has drawn the triangle wrong – there should be 14, as it needs to be the minimum number.



# Finding the Sum of Interior Angles in a Polygon

3. Find the angle labelled  $x$ .



4. A polygon has  $n$  sides

a) Write an expression, in terms of  $n$ , to represent the number of triangles inside the polygon.  $n - 2$

b) Write an expression, in terms of  $n$ , to represent the sum of interior angles of the polygon.  $(n - 2) \times 180$

5. Calculate the size of each interior angle in a regular hexagon.  $120^\circ$

