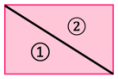
Polygon Formulae Reminders

Let n = number of sides

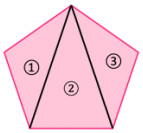
Sum Of All Interior Angles

$$180(n-2)$$

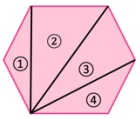
Why is the formula true?
There are always 2 triangles less than sides & triangles add to 180°.



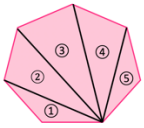
4 sides
2 triangles
180 x 2



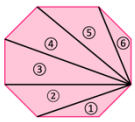
5 sides
3 triangles
180 x 3



6 sides
4 triangles
180 x 4



7 sides
5 triangles
180 x 5



8 sides
6 triangles
180 x 6

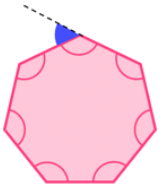
etc

triangle(number of sides - 2)

1 Interior Angle

$$\frac{180(n-2)}{n}$$

1 Exterior Angle

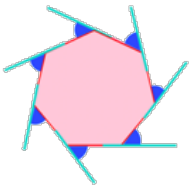


$$\frac{360}{n}$$

We can also use the formula

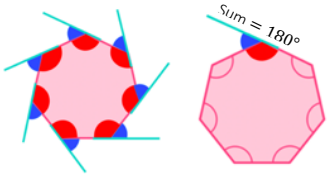
$$180 - \text{interior angle}$$

Why can we use the first formula?
All exterior angles add to 360°, so to find 1 exterior angle we divide by the number of sides



Why can we use the second formula? This is because the interior and exterior angles are straight line angles

Interior + exterior = 180°



Number Of Sides

$$\frac{360}{\text{exterior angle}}$$

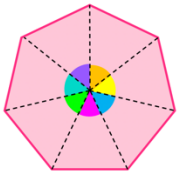
We can also use the formula

$$\frac{360}{180 - \text{interior angle}}$$

Alternative method:
This requires being good at algebra though!
Solve the following equation for n

$$\frac{180(n-2)}{n} = \text{interior angle}$$

Angles At The Centre



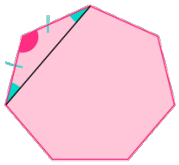
Each angle at the centre

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

This is just the same as the formula for an exterior angle.

You may also need to use some angle rules:

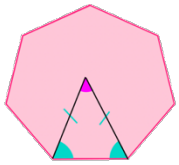
Isosceles Triangle



The base angles are equal

each $\triangle = \frac{180 - \text{vertex angle}}{2}$

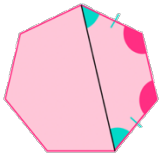
Isosceles Triangle



The base angles are equal

each $\triangle = \frac{180 - \text{vertex angle}}{2}$

Isosceles Trapezoid



each $\triangle = \frac{180 - \text{other base angle}}{2}$

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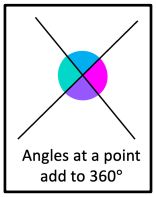
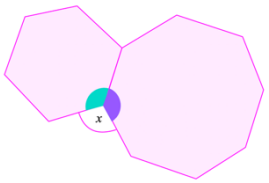


Angles at a point add to 360°



$$\frac{180(5-2)}{5} = 108°$$

$$\frac{180(8-2)}{8} = 135°$$

$$360 - 108 - 135 = 117°$$