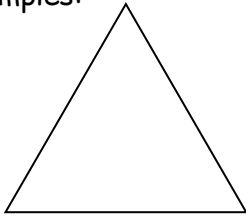
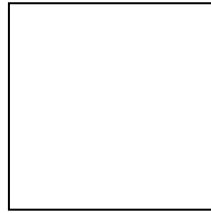


Polygon Investigation – Protractors Not Allowed (But Brains Are)

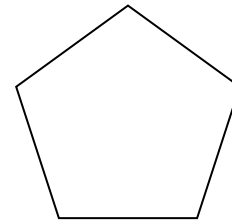
A **regular polygon** is a polygon with congruent sides and congruent angles. Here are some examples:



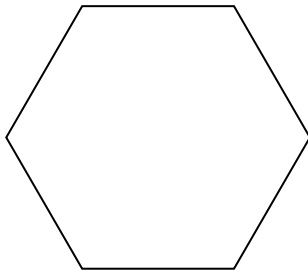
REGULAR TRIANGLE



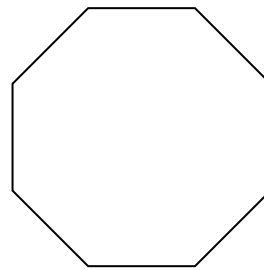
REGULAR QUADRILATERAL



REGULAR PENTAGON

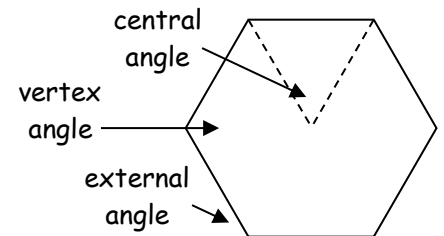


REGULAR HEXAGON



REGULAR OCTOGON

The **central angle** is formed by drawing line segments from the centre of the polygon to two adjacent vertices. The **vertex angle** is the angle between adjacent sides. The **external angle** is the angle between one side and the extension of an adjacent side.



1. Complete this table. As an example, one row has been completed for you.

Name	Number of sides N	Central Angle C	External angle E	Sum of external angles SE	Vertex angle V	Sum of vertex angles SV
Triangle						
Quadrilateral						
Pentagon						
Hexagon	6	60°	60°	360°	120°	720°
Heptagon						
Octagon						
Nonagon						
Decagon						
Dodecagon						
24-gon						

For the following questions, try to express your rule using correct algebraic notation.

- What is the rule for the central angle C given the number of sides N ?
- What is the rule for the vertex angle V given the number of sides N ?
- What is the rule for the external angle E given the number of sides N ?
- What is the rule for the sum of the external angles SE for any regular polygon?
- What is the rule for the sum of the vertex angles SV given the number of sides N ?