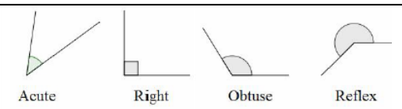
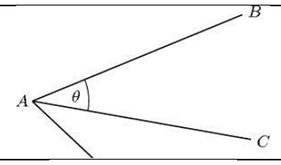
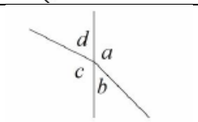
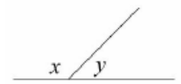
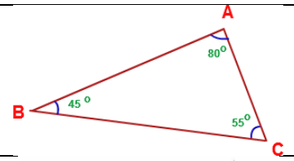
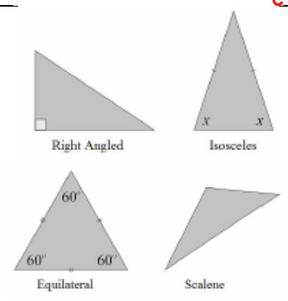
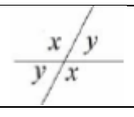
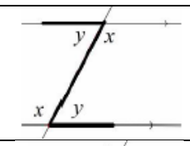
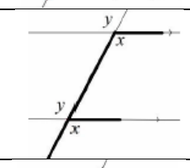
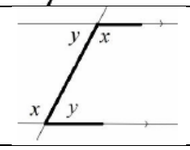
**Maths** *Knowledge Organiser*

*8B1c:* **Angles**

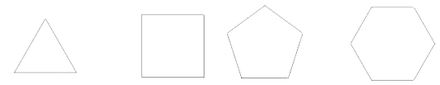
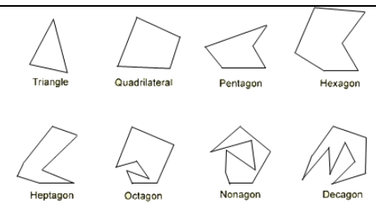
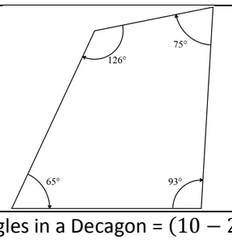
**Basic Angle Facts**

| | | |
|---|---|---|
| Types of Angles | **Acute angles** are less than 90°.<br>**Right angles** are exactly 90°.<br>**Obtuse angles** are greater than 90° but less than 180°.<br>**Reflex angles** are greater than 180° but less than 360°. |  |
| Angle Notation | Can use **one lower-case** letters, eg. $\theta$ or $x$<br><br>Can use **three upper-case** letters, eg. $BAC$ |  |
| Angles at a Point | **Angles around a point add up to 360°**. |  <br>$a+b+c+d=360^o$ |
| Angles on a Straight Line | **Angles around a point on a straight line add up to 180°**. |  <br>$x+y=180^o$ |
| Angles in a Triangle | **Angles in a triangle add up to 180°.** |  |
| Types of Triangles | **Right Angle** Triangles have a **90°** angle in.<br><br>**Isosceles** Triangles have **2 equal sides** and **2 equal base angles**.<br><br>**Equilateral** Triangles have **3 equal sides** and **3 equal angles (60°)**.<br><br>**Scalene** Triangles have **different sides** and **different angles**.<br><br>**Base angles in an isosceles triangle are equal.** |  |
| Opposite Angles | **Vertically opposite angles are equal**. |  |

**Parallel Lines**

| | | |
|---|---|---|
| Alternate Angles | **Alternate angles are equal**.<br>They look like Z angles, but never say this in the exam. |  |
| Corresponding Angles | **Corresponding angles are equal**.<br>They look like F angles, but never say this in the exam. |  |
| Co-Interior Angles | **Co-Interior angles add up to 180°**.<br>They look like C angles, but never say this in the exam. |  |

**Polygons**

| | | |
|---|---|---|
| Polygon | A **2D** shape with **only straight edges**. | Rectangle, Hexagon, Decagon, Kite etc. |
| Regular | A shape is regular if all the **sides** and all the **angles** are **equal**. |  |
| Names of Polygons | **3**-sided = **Triangle**<br>**4**-sided = **Quadrilateral**<br>**5**-sided = **Pentagon**<br>**6**-sided = **Hexagon**<br>**7**-sided = **Heptagon**<br>**8**-sided = **Octagon**<br>**9**-sided = **Nonagon**<br>**10**-sided = **Decagon** |  |
| Angles in a Quadrilateral | **Angles in a quadrilateral add up to 360°.** |  |
| Sum of Interior Angles | $(\boldsymbol{n-2})\times\boldsymbol{180}$<br>where n is the number of sides. | Sum of Interior Angles in a Decagon = $(10-2)\times 180 = 1440°$ |
| Size of Interior Angle in a Regular Polygon | $\frac{(\boldsymbol{n-2})\times\boldsymbol{180}}{\boldsymbol{n}}$<br><br>You can also use the formula:<br>$\boldsymbol{180 - Size\ of\ Exterior\ Angle}$ | Size of Interior Angle in a Regular Pentagon = $\frac{(5-2)\times 180}{5} = 108°$ |
| Size of Exterior Angle in a Regular Polygon | $\frac{\boldsymbol{360}}{\boldsymbol{n}}$<br><br>You can also use the formula:<br>$\boldsymbol{180 - Size\ of\ Interior\ Angle}$ | Size of Exterior Angle in a Regular Octagon = $\frac{360}{8} = 45°$ |