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| **H Unit 5: Angles and trigonometry** | **Road Map** | | | | | |
| In this unit you will learn about number. The aims are as follows:  **LG1**: Knowledge  **LG2**: Application  **LG3**: Skills | Assessment Grades |  |  | | | |
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| **Themes** | **Learning Goals/Outcomes/Content** | | |  |  |  |
| 5a Polygons, angles and parallel lines | Classify quadrilaterals by their geometric properties and distinguish between scalene, isosceles and equilateral triangles; | | |  |  |  |
| Understand ‘regular’ and ‘irregular’ as applied to polygons; | | |  |  |  |
| Understand the proof that the angle sum of a triangle is 180°, and derive and use the sum of angles in a triangle; | | |  |  |  |
| Use symmetry property of an isosceles triangle to show that base angles are equal; | | |  |  |  |
| Find missing angles in a triangle using the angle sum in a triangle AND the properties of an isosceles triangle; | | |  |  |  |
| Understand a proof of, and use the fact that, the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices; | | |  |  |  |
| Explain why the angle sum of a quadrilateral is 360°; | | |  |  |  |
| Understand and use the angle properties of quadrilaterals and the fact that the angle sum of a quadrilateral is 360°; | | |  |  |  |
| Understand and use the angle properties of parallel lines and find missing angles using the properties of corresponding and alternate angles, giving reasons; | | |  |  |  |
| Use the angle sums of irregular polygons; | | |  |  |  |
| Calculate and use the sums of the interior angles of polygons, use the sum of angles in a triangle to deduce and use the angle sum in any polygon and to derive the properties of regular polygons; | | |  |  |  |
| Use the sum of the exterior angles of any polygon is 360°; | | |  |  |  |
| Use the sum of the interior angles of an n-sided polygon; | | |  |  |  |
| Use the sum of the interior angle and the exterior angle is 180°; | | |  |  |  |
| Find the size of each interior angle, or the size of each exterior angle, or the number of sides of a regular polygon, and use the sum of angles of irregular polygons; | | |  |  |  |
| Calculate the angles of regular polygons and use these to solve problems; | | |  |  |  |
| Use the side/angle properties of compound shapes made up of triangles, lines and quadrilaterals, including solving angle and symmetry problems for shapes in the first quadrant, more complex problems and using algebra; | | |  |  |  |
| Use angle facts to demonstrate how shapes would ‘fit together’, and work out interior angles of shapes in a pattern. | | |  |  |  |

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| 5b Pythagoras’ theorem and trigonometry | Understand, recall and use Pythagoras’ Theorem in 2D; |  |  |  |
| Given three sides of a triangle, justify if it is right-angled or not; |  |  |  |
| Calculate the length of the hypotenuse in a right-angled triangle (including decimal lengths and a range of units); |  |  |  |
| Find the length of a shorter side in a right-angled triangle; |  |  |  |
| Calculate the length of a line segment *AB* given pairs of points; |  |  |  |
| Give an answer to the use of Pythagoras’ Theorem in surd form; |  |  |  |
| Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures; |  |  |  |
| Use the trigonometric ratios to solve 2D problems; |  |  |  |
| Find angles of elevation and depression; |  |  |  |
| Know the exact values of sin *θ* and cos *θ* for *θ* = 0°, 30°, 45°, 60° and 90°; know the exact value of tan *θ* for *θ* = 0°, 30°, 45° and 60°. |  |  |  |

**Links:**

LG1: You will build on your knowledge of shapes and angles to learn a wide variety of processes for calculating and working with angles and side lengths.

LG2: You will apply the processes from this topic by working out which rules to apply to different geometric problems, and by explaining your reasoning.

LG3: You will use your problem-solving skills and mastery of geometry to solve complex Mathematical problems such as problems linking angles with algebra.