

Essential Knowledge Milestones		Teaching Points	
<ul style="list-style-type: none"> understand and be able to use the definitions of sine, cosine and tangent for all arguments; understand and be able to use the sine and cosine rules; understand and be able to use the area of a triangle in the form $\frac{1}{2}ab \sin C$; understand and be able to use the sine, cosine and tangent functions; their graphs, symmetries and periodicity. 		<ul style="list-style-type: none"> Use of trigonometric ratios will have been covered at GCSE (9-1) Mathematics; questions should now be focused more on multi-step problems and questions set in context. When using the sine rule the ambiguous case should be covered. Links to proof can be made, for example proving the area of a triangle. Students should be encouraged to write down any formulae they will be using before substituting in the numbers. Students should be able to solve questions in various contexts; these could include coordinate geometry or real-life situations. Questions may involve bearings, which may not be well remembered from GCSE so should be reviewed. Students should be encouraged to check that their answers are realistic as this check can show up errors. When completing multi-step questions emphasise to students that they should show all working out and use the answer function on their calculators to avoid rounding errors. It can be a useful teaching point to divide the class asking one side to round all answers and the other to keep values stored in their calculator to show how this affects the final answer. Students should be shown the x and y coordinates of points on the unit circle can be used to give cosine and sine respectively. CAST or 3 graph method should be shown – 3 graph for understanding The unit circle can again be used to show how the trigonometric graphs are formed. Characteristics such as the period and amplitude should be discussed. Knowledge of graphs of curves with equations such as $y = \sin x$, $y = \cos(x + 30)$, $y = \tan 2x$ is expected so this is a good opportunity to recap transformations. 	
Assumed Prior Knowledge/ Links / Interleaving			
<ul style="list-style-type: none"> GCSE: Trig Ratios, Sine and Cosine Rule, Pythagoras Theorem Trigonometric ratios are used when resolving forces in perpendicular directions in Mechanics 			
Potential Barriers to Access /Misconceptions			
<ul style="list-style-type: none"> Students occasionally assume that triangles given in exam questions are right-angled and so use right-angled trigonometric ratios rather than the sine and cosine rules. A frequently seen error in these questions is students using the cosine rule to calculate an incorrect angle, sometimes despite having drawn a correctly labelled diagram. This indicates a lack of understanding of how the labelling of edges and angles on a diagram relates to the application of the cosine rule formula. 			
Questions & Prompts		Opportunities for Reasoning/Problem Solving/Proofs	
<ul style="list-style-type: none"> How would you explain why there are two triangles PQR with the properties $\angle P = 30^\circ$, $PQ = 12$, $QR = 8$? What quadrant does x lie if $\cos x > 0$ and $\sin x < 0$? Express $\sin(207)$ as the tangent ratio of an acute angle How many solutions does $\sin 3x = -0.1$ have in the range $0 < x < 180$ 		<ul style="list-style-type: none"> Proof of the sine and cosine rules. Use of the graphs can be linked to modelling situations such as yearly temperatures, wave lengths and tidal patterns. 	
Key Mathematical Vocabulary	Sine, cosine, tangent, angle of elevation, angle of depression, bearing, degree, identity, special angles, unit symmetry, hypotenuse, opposite, adjacent,		
Personal Development		Notes	Resources
Independence & resolve need to be nurtured. Execute unaided after being shown a demonstration of how to approach problem solving. Prepare them to work through a problem independently in life.			