The Sutton Academy

Knowledge Rich Curriculum Plan

Year 12 Maths

Unit 9 - Trigonometric ratios

Maths Year 12	Unit: Trigonometric ratios			
Lesson/Learning Sequence	**Intended Knowledge:** *Students will know that…*	**Tiered Vocabulary**	**Prior Knowledge:** *In order to know this students, need to already know that…*	**Assessment**
Lesson 43: The cosine rule Lesson Objective: To learn how to use the cosine rule to find missing sides and angles of a triangle.	• Students will know how to use the standard trigonometric ratios to prove the cosine rule. • Students will know that they can use the cosine rule to find missing sides of a triangle when 2 sides and the angle between them are known. • Students will know how to use the cosine rule to find the missing side of a triangle. • Students will know that they can use the cosine rule to find missing angles of a triangle when all 3 sides of the triangle are known. • Students will know how to use the cosine rule to find the missing angle of a triangle. • Students will know how to use the cosine rule in problems involving bearings. • Students will know how to use the cosine rule in problems involving algebraic expressions. • Students will know how to use the cosine rule in problems involving ratio.		• *Students need to know the standard trigonometric functions.* • *Students need to know how to use the standard trigonometric functions to find missing sides or angle in right-angled triangles.* • *Students need to know how to rearrange formulae.* • *Students need to know how to substitute values into formulae.* • *Students need to know how to use ratio to solve problems.* • *Students need to know how to know how to label triangles appropriately.*	
Lesson 44: The sine rule Lesson Objective: To learn how to use the sine rule to find missing sides and angles in a triangle.	• Students will know how to use the standard trigonometric ratios to prove the sine rule. • Students will know that they can use the sine rule to find missing sides of a triangle two angles and one opposite side are known. • Students will know how to use the sine rule to find the missing side of a triangle. • Students will know that they can use the sine rule to find missing angles of a triangle when two sides and one opposite angle is given. • Students will know how to use the sine rule to find the missing angle of a triangle. • Students will know how to use the sine rule in problems involving bearings. • Students will know how to use the sine rule in problems involving algebraic expressions.		• *Students need to know the standard trigonometric functions.* • *Students need to know how to use the standard trigonometric functions to find missing sides or angle in right-angled triangles.* • *Students need to know how to rearrange formulae.* • *Students need to know how to substitute values into formulae.* • *Students need to know how to use ratio to solve problems.* • *Students need to know how to know how to label triangles appropriately.*	

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Lesson 45: The sine rule/Areas of triangles Lesson Objective: To learn how to use the sine rule to find the area of triangles.	• Students will know that the sine rule sometimes produces two possible solutions for a missing angle. • Students will know that one possible angle is acute and the other is obtuse. • Students will know how to find both possible angle values using the sine rule. • Students will know how to recognise when they can use the sine rule to find the area of a triangle. • Students will know how to use the standard trigonometric ratios to prove the use of the sine rule for finding the area of triangles. • Students will know how to use the sine rule to find the area of a triangle. • Students will know how to use the area to find a missing angle or side. • Students will know that they can only use the sine rule to find the area of a triangle when 2 sides and the angle between them is known.		• *Students need to know what acute anf obtuse angles are.* • *Students need to know the basic shape of the sine graph for angles from 0 to 180 degrees.* • *Students need to know how to use the sine rule to find missing angles and sides.* • *Students need to know how to use the cosine rule to find missing angles and sides.* • *Students need to know how to rearrange formulae.* • *Students need to know how to substitute values into formulae.* • *Students need to know how to find the area of a right-angled triangle.*	
Lesson 46: Solving triangle problems Lesson Objective: To learn how to solves triangle problems.	• Students will know how to use standard right-angled triangle trigonometry and Pythagoras' theorem to solve problems. • Students will know how to use the sine and cosine rules to solve problems. • Students will know which rule or theorem to use based on the information given. • Students will know how to use multiple steps to find a missing angle or side.		• *Students need to know to use the sine rule to find a side when two angles and one opposite side is known.* • *Students need to know to use the sine rule to find an angle when two sides and one opposite angle is known.* • *Students need to know to use the cosine rule to find a side when two sides and the angle between them is known.* • *Students need to know to use the sine rule to find an angle when all three sides are known.* • *Students need to know to use the sine rule to find the area of a triangle when two sides and the angle between them is known.* • *Students need to know when to use standard right-angled trigonometry.* • *Students need to know to use Pythagoras' theorem when finding the side of a right-angled triangle when two sides are known.*	

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Lesson/Learning Sequence	**Intended Knowledge:** *Students will know that…*	**Tiered Vocabulary**	**Prior Knowledge:** *In order to know this students, need to already know that…*	**Assessment**
			• *Students need to know how to rearrange formulae.* • *Students need to know how to substitute values into formulae.*	
Lesson 47: Graphs of sine, cosine and tangent Lesson Objective: To learn how to draw the graphs of sine, cosine and tangent.	• Students will know that trigonometric graphs are periodic which means that they repeat themselves after a certain interval. • Students will know the basic shape of the sine graph. • Students will know how to draw the sine graph for a given range of values. • Students will know that the sine graph repeats every 360 degrees. • Students will know that the sine graph crosses the x-axis at …,-180, 0, 180, 360,…degrees. • Students will know that the sine graph has a maximum value of 1 and a minimum value of -1. • Students will know the basic shape of the cosine graph. • Students will know how to draw the cosine graph for a given range of values. • Students will know that the cosine graph repeats every 360 degrees. • Students will know that the cosine graph crosses the x-axis at …,-90, 90, 270, 450,…degrees. • Students will know that the cosine graph has a maximum value of 1 and a minimum value of -1. • Students will know the basic shape of the tangent graph. • Students will know how to draw the tangent graph for a given range of values. • Students will know that the tangent graph repeats every 180 degrees. • Students will know that the tangent graph crosses the x-axis at …,-180, 0, 180, 360,…degrees. • Students will know that the tangent graph has no maximum or minimum value.		• *Students need to know how to draw graphs using a range of values.* • *Students need to know how to use graphs to estimate values.* • *Students need to know how to find the solutions to some trigonometric ratios.*	

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	• Students will know that the tangent graph has vertical asymptotes at x= -90, x=90, x=270,… • Students will know how to use the trigonometric graph to find values for given angles.			
Lesson 48: Transforming trigonometric graphs Lesson Objective: To learn how to transform trigonometric graphs.	• Students will know that sine, cosine and tangent are all function. • Students will know how to translate the sine, cosine and tangent graphs. • Students will know how to stretch the sine, cosine and tangent graphs. • Students will know how to reflect the sine, cosine and tangent graphs.		• *Students need to know the basic shapes of the sine, cosine and tangent graphs.* • *Students need to know how to draw the graphs of sine, cosine and tangent.* • *Students need to know how to translate graphs.* • *Students need to know how to stretch graphs.* • *Students need to know how to reflect graphs.*	