THE ACADEMY OF ST NICHOLAS	Y12 Pure	CH10 10.1,10.2,10.3,10.4,10.5,10.6	Trigonometric Identities Trigonometric Identities & Equations	Lessons 6

Essential Knowledge Milestones	Teaching Points
• be able to solve trigonometric equations within a given interval • understand and be able to use $\tan\theta = \frac{\cos\theta}{\sin\theta}$ • Understand and use $\sin^2\theta + \cos^2\theta = 1$ • Solve trigonometric equation that produce quadratics	• When solving trigonometric equations, finding multiple values within a range can initially be illustrated using the graphs of the functions. The decision can then be made whether to move on to using CAST diagrams or continue using graphs. Whichever method is used students will need plenty of practice in identifying all values within the limits correctly. • Intervals with negative solutions as well as positive solutions should be used. • Students should be able to solve equations such as $\sin(x + 70°) = 0.5$ for $0 < x < 360°$; $3 + 5\cos 2x = 1$ for $-180° < x < 180°$; and $6\cos 2x + \sin x - 5 = 0$ for $0 < x < 360°$, giving their answers in degrees. • Students should be comfortable factorising quadratic trigonometric equations and finding all possible solutions. It should be noted that in some cases only one of the factorisations will give solutions but in most case there will be two sets of solutions. Situations where one answer is equal to zero can cause some confusion with students then not looking for further solutions. • This sort of example should be covered in class. For example, the equation, $\sin\theta(3\sin\theta + 1) = 0$ will often be simplified to just $3\sin\theta + 1 = 0$, resulting in the loss of solutions to the original equation.
Assumed Prior Knowledge/ Links / Interleaving	
• GCSE: Trigonometry, Trigonometry graphs & Pythagoras's Theorem • Integration and differentiation	
Potential Barriers to Access/Misconceptions	**Opportunities for Reasoning/Problem Solving/Proofs**
• Common errors include: not finding values in the given range; finding extra, incorrect, solutions; not going on to find the values of x and instead leaving the values for, say 2x or x + 30; algebraic slips when rearranging the equation; and not giving answers to the correct degree of accuracy. • The loss of accuracy in the final answers to trigonometric equations is common and often results in the unnecessary loss of marks. • Sketches of the trigonometric functions are often helpful to check all solutions have been found.	• if graphs are used to model situations then the equations can be used to find values at given points. • Prove the identities $\frac{\sin\theta}{\cos\theta} = \tan\theta$ and $\sin^2\theta + \cos^2\theta = 1$.
	Questions & Prompts
	• Make up three trigonometric equations to solve that show you understand the symmetry of the three trigonometric curves. • Tell me the property that α and β $(\alpha \neq \beta)$must have in order that $\sin\alpha = \sin\beta$ • Given that $\cos\theta = \frac{4}{5}$ and $0 < \theta < 180$, determine the value of $\sin\theta$

Key Mathematical Vocabulary	Sine, cosine, tangent, interval, period, amplitude, function, inverse, degree, identity, special angles, symmetry

Personal Development	Notes	Resources
Pupils to learn that mathematicians achieve their 'personal best' through working collaboratively with other specialist mathematicians in order to interrelate more than one discipline.		