

Trigonometry (AS)

- E1 Understand and use the definitions of sine, cosine and tangent for all arguments; the sine and cosine rules; the area of a triangle in the form $\frac{1}{2}ab \sin C$.
- E3 Understand and use the sine, cosine and tangent functions; their graphs, symmetries and periodicity.
- E5 Understand and use $\tan \theta = \frac{\sin \theta}{\cos \theta}$. Understand and use $\sin^2 \theta + \cos^2 \theta = 1$.
- E7 Solve simple trigonometric equations in a given interval, including quadratic equations in \sin , \cos and \tan and equations involving multiples of the unknown angle.

For a brief commentary on this content go to the [MEI outline SoW](#).

Pre-requisites

- GCSE: Trigonometry including use of trigonometric ratios, exact values of particular angles, and sine and cosine rules.
- GCSE: Knowledge and understanding of Pythagoras' Theorem.
- The [Transition to A level Mathematics course](#) is designed to support students as they commence their AS study. There are seven topics including Trigonometry. The course is freely available from [Integral](#).

Teaching it!

- A series of ten [videos](#) designed to support students on this topic.
- [Solving trigonometric equations](#) card sort ([Solution](#)).
- [GeoGebra file](#) linking the unit circle to trig graphs.
- [Trigonometric Graphing](#): A Desmos Classroom activity looking at vertical stretches of trig functions.
- [GeoGebra file](#) showing solutions to trig equations in a specified interval.
- Trigonometric equations (student task): [Autograph](#), [Casio](#), [Desmos](#), [GeoGebra](#)

Common student errors

- When solving equations, not finding all of the solutions for the given range of angles.
- Not appreciating the difference between an exact answer (as asked for in a question) and writing down a value to, say, ten decimal places from a calculator.
- Getting the sine and cosine curves mixed up.

Getting them thinking

- Tell me the property that α and β ($\alpha \neq \beta$) must have in order that $\sin \alpha = \sin \beta$.
- How would you explain why there are two triangles PQR with the properties $\angle P = 30^\circ$, $PQ = 12$, $QR = 8$?
- Give a reason why each of $\sin \theta$, $\cos \theta$ and $\tan \theta$ could be the odd one out.
- Make up three trigonometric equations to solve that show you understand the symmetry of the three trigonometric curves.
- Prove the sine rule, the cosine rule and the formula $\frac{1}{2}ab \sin C$ for the area of a triangle.