Railway Engineering Mathematics for Apprentices

Revision Guide: 2

Trigonometry

I should be able to:

- Recognise and know the basic properties of sine, cosine and tangent waves.

- Apply Pythagoras' theorem and SOH-CAH-TOA trigonometry to determine angles and side lengths of right-angle triangles.

- Apply the sine and cosine rules to determine angles and side lengths of general triangles.

- Understand how parameters such as amplitude and angular frequency influence a general trigonometric function.

- Solve trigonometric equations with multiple solutions.

Differential Calculus

I should be able to:

- Evaluate basic derivatives.

- Utilise the chain rule, product rule and quotient rule to differentiate more complicated functions and understand when to select each of these three techniques.

- Understand how to apply differentiation to solve problems regarding rates of change.

- Use derivatives to locate all stationary points of a function.

- Use the second derivative test to classify stationary points.

Integral Calculus I

I should be able to:

- Evaluate basic definite and indefinite integrals.

- Use integration by substitution to evaluate more complicated integrals.