

# Calculus of Powers

## Station guide

At this station, we introduce the idea of calculus as a set of tools, along with methods for differentiation and integration of expressions built from powers of  $x$ .

[Gradient spotting](#) is a resource that can be used to explore the derivatives of quadratic and cubic functions of  $x$ , searching for patterns and a general rule. Differentiation is exercised as a tool for finding turning points on curves in [Floppy hair](#) and for identifying tangents and normals to curves in [Tangent or normal](#).

The use of integration to find the areas under curves is explored in [Meaningful areas](#) alongside some other techniques drawing on ideas of symmetry and averages. The resource [Integral chasing](#) provides an interesting context for practising definite integrals, and also spotlights the connection between an integral and an area.

A large number of Review questions are available, providing opportunities to reinforce the methods covered at this station.