

Chapter notes: 17 Basic integration and its applications**Overview**

This chapter starts with the idea of ‘anti-differentiation’ and its rules, then moves on to definite integration before interpreting this in the context of areas. It needs approximately eight hours of teaching time.

Introductory problem

This problem presents an example of a physical situation when the areas under a curve are important. You might like to ask students about other such situations they can think of from their studies. The worked solution is given at the end of the chapter, page 596; the idea being that students should be able to answer the question using the methods covered in the chapter.

17A-D

There are no specific teacher notes for these sections.

17E Integrating trigonometric functions, p576

Hints for grade 7 questions:

3. Use an identity for $\cos 2x$, and the difference of two squares.

17F Finding the equation of a curve, p577

Hints for grade 7 questions:

4. The gradient of the normal is $\frac{-1}{\frac{dy}{dx}}$. Set up an equation to find $\frac{dy}{dx}$.

17G Definite integration, p579

The important emphasis here should be on using the graphical calculator effectively. Very strong students are often reluctant to do this.

17H Geometrical significance of definite integration, p581

There are no specific teacher notes for this section.

17I The area between a curve and the y-axis, p588

One common error here is in assessing the limits of the integration correctly. Students often use x -coordinates instead.

Hints for grade 7 questions:

5. One equation concerns the areas, the other reflects the fact that (a, b) is on the curve $y = x^2$.

17J The area between two curves, p591

Hints for grade 7 questions:

8. Find the intersection point in terms of m .
9. Find the area from the y -axis rather than the x -axis.