

## PROBLEM SHEET 11

**11.1** Integrate  $\cos(3x + 4)$ .

**11.2** Integrate  $(1 - 2x)^{10}$ .

**11.3** Integrate  $e^{4x-1}$ .

**11.4** Integrate  $(4x + 3)^{-1}$ .

**11.5** Find the equation of the curve passing through the point  $(1, 2)$  satisfying  $dy/dx = 2x$ .

**11.6** A particle has acceleration  $(3t^2 + 4) \text{ ms}^{-2}$  at time  $t$  seconds. If its initial speed is  $5 \text{ ms}^{-1}$ , what is its speed at time  $t = 2$  seconds?

**11.7** Find the area between the graph of  $y = \sin x$  and the  $x$ -axis from  $x = 0$  to  $x = \pi/2$ .

**11.8** Find the area between the graph

$$y = \frac{1}{x-1}$$

and the  $x$ -axis between  $x = 2$  and  $x = 3$ .

**11.9** Find the signed area between the graph  $y = 2x + 1$  and the  $x$ -axis between  $x = -1$  and  $x = 3$ .

**11.10** Find  $y$ , given that

$$\frac{d^2y}{dx^2} = \sin x - \frac{4}{x^3}.$$