Section 3: Further integration

Exercise level 2

1. Find the following indefinite integrals

   (i) $\int \left(3\sqrt{x}-2\right)^2 \mathrm{d}x$ (ii) $\int \frac{(x-1)^2}{x^5}\,\mathrm{d}x$

   (iii) $\int \frac{\sqrt{x}+x^{\frac{3}{2}}+7x^3}{\sqrt{x}}\,\mathrm{d}x$ (iv) $\int \frac{(x^2-1)(x^2+1)}{x^2}\,\mathrm{d}x$

2. Evaluate the following definite integrals:

   (i) $\int_1^4 \frac{2-x+3x^2}{\sqrt{x}}\,\mathrm{d}x$

   (ii) $\int_1^2 \frac{x^2-1}{x^4}\,\mathrm{d}x$

3. A curve has gradient function $\frac{\mathrm{d}y}{\mathrm{d}x}=\frac{x-3}{x^3}$ and passes through the point (1, 1). Find the equation of the curve.

4. Find the area enclosed by the curve $y=x-\sqrt{x}$ and the x-axis.