

Section 2: Area under a curve

Exercise level 2

1. Evaluate:

(i) $\int_{-2}^2 (x+3)(x-2) dx$

(ii) $\int_0^2 x(x^2+1) dx$

2. Find the total area enclosed by $y = x^2 - 2x - 3$, the x axis, $x = -3$ and $x = 3$.3. Find the total area enclosed by $y = x(x-1)$, the x axis and the line $x = 2$.4. (i) Sketch the curve $y = x^3 - x$ for values of x from -3 to $+3$.(ii) Find the area bounded by the curve, the x axis and the lines $x = 1$ and $x = 2$.(iii) Find the area bounded by the curve and the lines $x = -1$, $x = 0$ and the x axis.(iv) From your answers to (ii) and (iii) and your sketch deduce the total area given by the integral $\int_0^2 (x^3 - x) dx$. Explain your reasoning.5. (i) Sketch the general shape of curve $y = x(x+2)(x-3)$ showing where it crosses the x -axis.(ii) Find the total area enclosed between the graph and the x -axis.6. Find the area enclosed by the curve $y = (x-3)^2$ and the lines $y = 0$ and $y = 4$.7. Find the total area enclosed by the curve $y = x(4-x^2)$ and the x -axis.