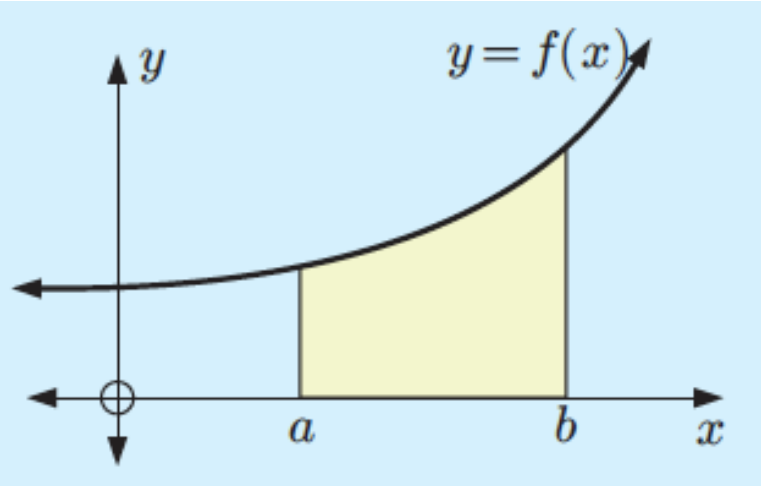
Application of integration – Area

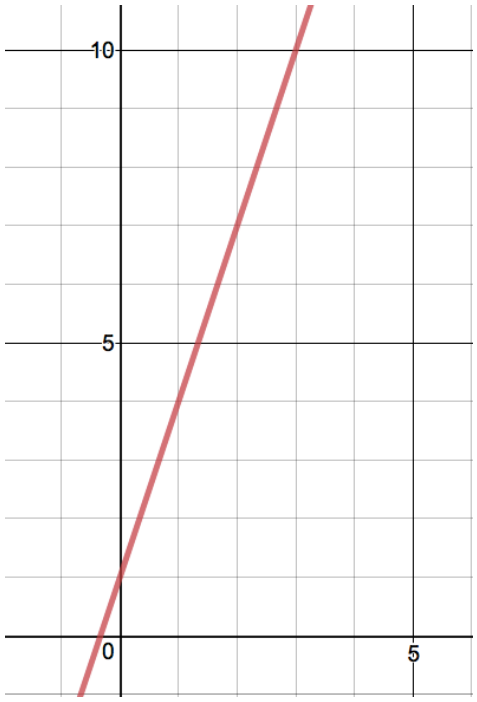
Area below the curve

$$\boldsymbol{Area = \int_a^b f(x)dx\,, where\ b > a.}$$

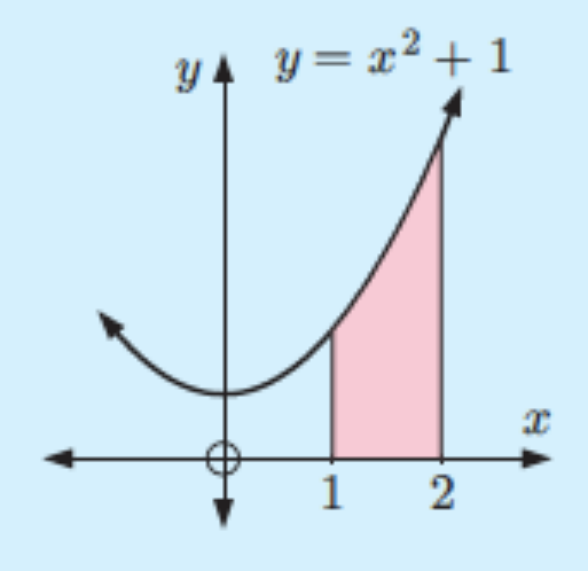


1. The following diagram shows part of the graph of $f(x) = 3x + 1$.

   Find the area of the region enclosed by $f(x)$, the x-axis, $x = 0 \; and \; x = 2$.

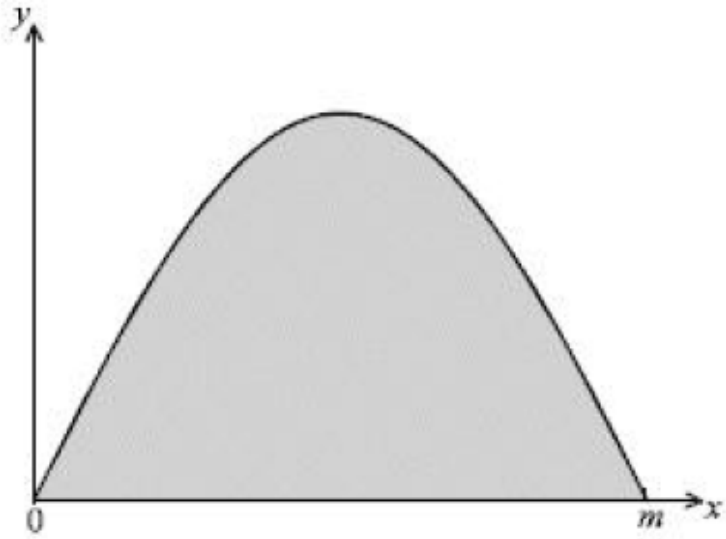


2. Find the area of the region enclosed by $y = x^2 + 1$, the x-axis, $x = 1\ and\ x = 2$.



Paper 1

1. The diagram below shows part of the graph of $y = \sin 2x$.
The shaded region is between $x = 0$ and $x = m$.

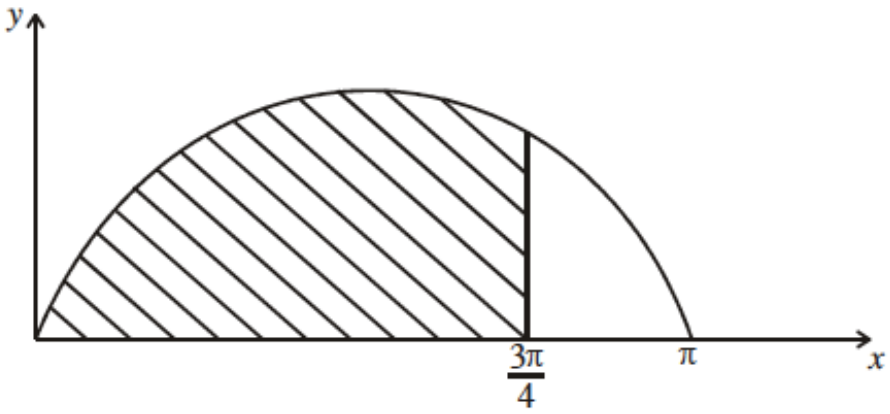


(a) Write down the period of this function.

(b) Hence or otherwise write down the value of m.

(c) Find the area of the shaded region.

2. The diagram shows part of the cure $y = \sin x$. The shaded region is bounded by the curve and the lines $y = 0$ and $x = \frac{3\pi}{4}$.



Given that $\sin\frac{3\pi}{4} = \frac{\sqrt{2}}{2}$ and $\cos\frac{3\pi}{4} = -\frac{\sqrt{2}}{2}$, calculate the exact area of the shaded region.