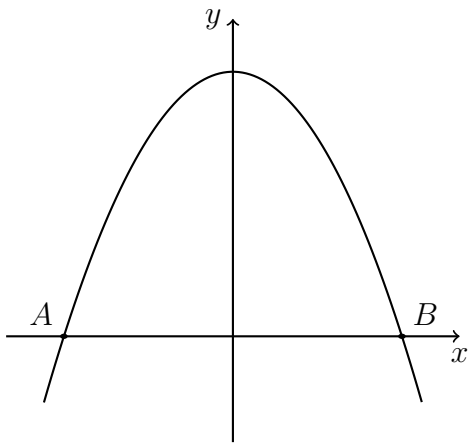
Do Now Quiz: Calculus & Trigonometry - with calculator

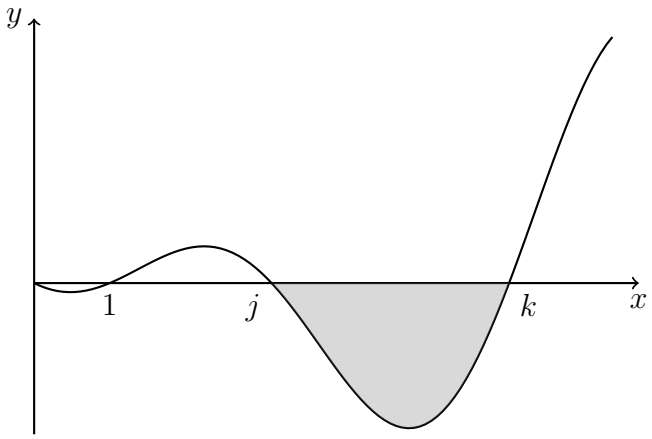
1. *Medium* Let $f(x) = 6 - x^2$. Part of the graph of f is shown in the following diagram.



   (a) The graph crosses the x-axis at the points A and B.
   Find the x-coordinate of A and of B. [3]

   (b) Find the area of the region enclosed by the graph of f and the x-axis. [3]

2. *Spicy* The graph of $y = (x-1)\sin x$, for $0 \leq x \leq \frac{5\pi}{2}$, is shown below.



   (a) The graph has x-intercepts at $0, 1, j,$ and k. Find j and k. [2]

   (b) The shaded region is rotated 360° about the x-axis. Let V be the volume of the solid formed. Write down an expression for V. [3]

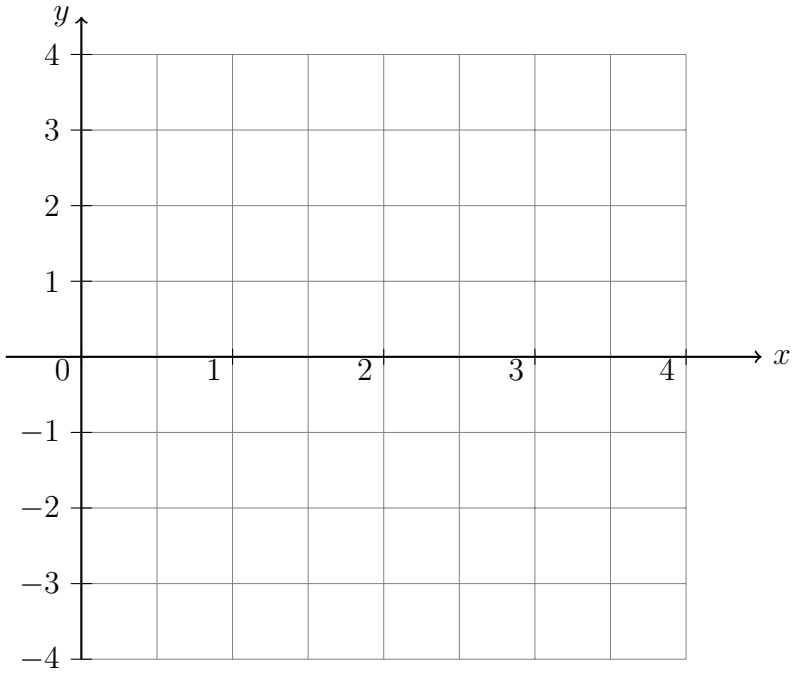
   (c) Find V. [2]

3. *Medium* Let $f(x) = 3\sin(\pi x)$.

   (a) Write down the amplitude of f. [1]

   (b) Find the period of f. [2]

   (c) On the following grid, sketch the graph of $y = f(x)$, for $0 \leq x \leq 3$.



[3]

4. *Spicy* Let $f(x) = \sin(x + \frac{\pi}{4}) + k$. The graph of f passes through the point $(\frac{\pi}{4}, 6)$.

   (a) Find the value of k. [2]

   (b) Find the minimum value of $f(x)$. [2]

   (c) Let $g(x) = \sin x$. The graph of g is translated to the graph of f by the vector $\begin{pmatrix} p \\ q \end{pmatrix}$.
   Write down the value of p and q. [2]