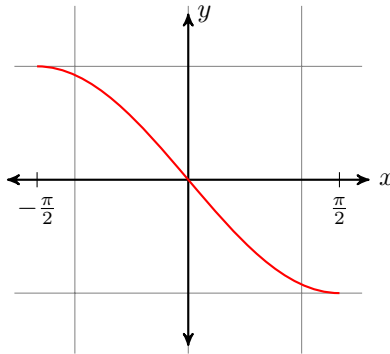# Quiz 3

1. Find the period and amplitude of $y = \sin(3t)$.

$$\boxed{A = 1, \qquad T = \frac{2\pi}{3}}$$

2. Sketch the graph of $\sin(-x)$ between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$.

3. If $h(t) = \sqrt{1 - t^2}$, find functions f and g such that $h(t) = f(g(t))$, and give the domains of each of f and g.

$$\boxed{\begin{array}{c} f(s) = \sqrt{s} \\ s = g(t) = 1 - t^2 \end{array}}$$

The domain of f is normally $[0, \infty)$, so that means the range of g has to lie in $[0, \infty)$. This means $0 \le 1 - t^2 < \infty$, which, in practice, means $t^2 \le 1$, which is true if $-1 \le t \le 1$, in which case $0 \le 1 - t^2 \le 1$. Thus, the domain of g is $[-1, 1]$ and its range is $[0, 1]$. In view of this, the domain of f is the range of g, i.e. $[0, 1]$, which means the range of f is $[0, 1]$:

$$\boxed{D(f) = [0, 1], \qquad R(f) = [0, 1], \qquad D(g) = [-1, 1], \qquad R(g) = [0, 1]}$$