Exercise 3

Write the composite function in the form $f(g(x))$. [Identify the inner function $u = g(x)$ and the outer function $y = f(u)$.] Then find the derivative dy/dx.

$$y = \tan \pi x$$

Solution

Here $f(x) = \tan x$ and $g(x) = \pi x$ so that $f(g(x)) = \tan \pi x$. Take the derivative now.

$$y' = \frac{d}{dx}(\tan \pi x) = (\sec^2 \pi x) \cdot \frac{d}{dx}(\pi x) = (\sec^2 \pi x) \cdot (\pi) = \pi \sec^2 \pi x$$