1. Differentiate the functions.

$$y = 3e^x + \frac{4}{\sqrt[3]{x}}$$

$$G(q) = \left(1 + q^{-1}\right)^2$$

$$y = \frac{\sqrt{x}}{2 + x}$$

$$g(x) = \left(\pi^{1/2} + 5\sqrt{x}\right) e^x$$

$$f(x) = \frac{ax + b}{cx + d}$$

2. Find the derivative of $f(x) = (x + x^2)(x^{-1} + 3)$ in two ways:

(i) by the product rule:

(ii) by first expanding the product:

3. Find an equation of a tangent line to the curve $y = x^4 + 1$ which is parallel to the line $32x - y = 15$.

4. If $h(2) = 4$ and $h'(2) = -3$, find

$$\frac{d}{dx}\left(\frac{h(x)}{x}\right)\Big|_{x=2} =$$