1. Using the definition of the derivative as a limit, find $f'(x)$ if $f(x) = \dfrac{2}{x-2}$.

2. Find the derivative of
$$y = \frac{3x^2 - 2}{\sqrt{x}} + \frac{x}{5\sqrt[3]{x^2}}$$

(Hint: simplify y so that it involves only power functions, multiplication by constants, and addition/subtraction - then differentiate.)