

**Example** Let  $y = \frac{3x^2+2\sqrt{x}}{x}$  find  $y'$

$$f(x) = 3x^2 + 2\sqrt{x} \Rightarrow f'(x) = 6x + \frac{2}{\sqrt{x}}$$

$$g(x) = x \Rightarrow g'(x) = 1$$

$$y' = \frac{f'(x)g(x) - g'(x)f(x)}{[g(x)]^2} = \frac{(6x + \frac{2}{\sqrt{x}})x - 1 \cdot (3x^2 + 2\sqrt{x})}{x^2} = \frac{3x^2 - \sqrt{x}}{x^2} = 3 - x^{-3/2}$$

Remark: Again if you don't have to use the Quotient Rule DON'T!!

So in the example above re-write  $y$  as  $y = 3x + 2x^{-1/2} \Rightarrow y' = 3 - x^{-3/2}$

**Example** Let  $y = \frac{1}{x^2+1}$  find  $y'$

$$y' = \frac{\frac{-1}{x^2}(x^2+1) - \frac{1}{x}(2x)}{(x^2+1)^2} = \frac{-3x^2-1}{x^2(x^2+1)^2}$$