(p.240) 2c) $r = \frac{2^t}{t}$

$$r' = \frac{\ln 2 \cdot 2^t \cdot t - 2^t \cdot (1)}{t^2}$$

$$= \frac{2^t}{t^2}(t \ln 2 - 1)$$

d) $f(x) = \frac{\sqrt{3^x}}{x^2}$

$$f'(x) = \frac{\frac{1}{2}(3^x)^{-\frac{1}{2}} \cdot 3^x \cdot \ln 3 \cdot x^2 - \sqrt{3^x} \cdot 2x}{x^4}$$

Unit 03: Lesson 1B – The Derivative of the Exponential Function

"e" = 2.718282.....

$\ln e = 1$

ex: $y = e^{2x}$

$y' = e^{2x} \cdot \ln e \cdot 2$

$= 2e^{2x}$

ex: $y = x^2 \cdot e^{2x^2+x}$

$y' = 2x \cdot e^{2x^2+x} + x^2 \cdot e^{2x^2+x} \cdot (4x+1)$

ex: $y = 3x^3 \cdot \sqrt{4e^{2x}}$

$y' = (9x^2)(4e^{2x})^{\frac{1}{2}} + (3x^3)(\frac{1}{2})(4e^{2x})^{-\frac{1}{2}} \cdot \ln 4 \cdot (4e^{2x})(e^{2x})(\ln e)(2)]$

$y = \frac{e^{2x^2} \cdot 3^{e^{2x}}}{(\sqrt{e})^{3x}}$ $\rightarrow (e^{\frac{1}{2}})^{3x} = e^{\frac{3x}{2}}$

$y' = \frac{[(e^{2x^2})(4x)(3^{e^{2x}}) + (e^{4x^2})(3^{e^{2x}})(\ln 3)(e^{2x})(2)][\sqrt{e}]^{3x} - e^{\frac{3}{2}x} \cdot (\frac{3}{2}) \cdot (e^{2x^2} \cdot 3^{e^{2x}})}{[\sqrt{e}]^{3x}]^2}$