MAT 230, Paper Quiz #2, Spring 2017 Name KEY

Instructions: Show all work, and provide exact answers. For full credit will be given to the steps shown than for the final answer. Be sure to provide thorough explanations.

1. Find $f'(x) = 0.2x^{1.2}$ if $f(x) = 0.2x^{1.2}$

$0.2(1.2)x^{0.2} = 0.24x^{0.2}$

2. Find the equation of the tangent line for $f(x) = \sqrt{x}$, at $x = 4$.

$f(x) = x^{1/2}$, $f'(x) = \frac{1}{2}x^{-1/2} = \frac{1}{2\sqrt{x}}$ $\quad f(4) = 2$

$f'(4) = \frac{1}{2\sqrt{4}} = \frac{1}{4}$

$y - 2 = \frac{1}{4}(x-4) \Rightarrow y - 2 = \frac{1}{4}x - 1 \Rightarrow y = \frac{1}{4}x + 1$

3. Find $\frac{dy}{dx}$ for each function using the product or quotient rule. You do not need to simplify.

a. $y = \frac{5x^2-1}{2x^3+3}$

$y' = \frac{10x(2x^3+3) - (6x^2)(5x^2-1)}{(2x^3+3)^2}$

b. $y = \left(t + \frac{2}{t}\right)(t^2 - 3)$

$\left(1 - \frac{2}{t^2}\right)(t^2-3) + \left(t + \frac{2}{t}\right)(t)$