New Jersey Institute of Technology DEPARTMENT OF MATHEMATICAL SCIENCES Math 111-029 Quiz 3

Your Name:

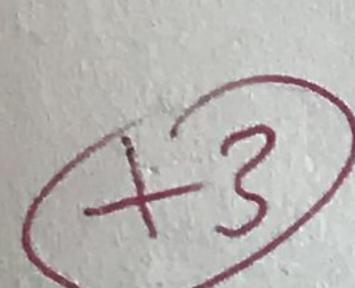
PROF. ALLAIRE

1. Find the derivative with respect to x of the following functions:

(a)
$$f(x) = x(x+2) = x^{2} + \lambda x$$

 $f'(x) = 2x + \lambda = \lambda(x+1)$

(b)
$$f(x) = \frac{\sqrt{x} + x^{1/3}}{x} = \frac{x^{1/3}}{x} + x^{1/3} = \frac{x^{1/3}}{x} + x^{1/3} = \frac{x^{1/3}}{x} + \frac{x^{1/3}}{x} = \frac{x^{1$$



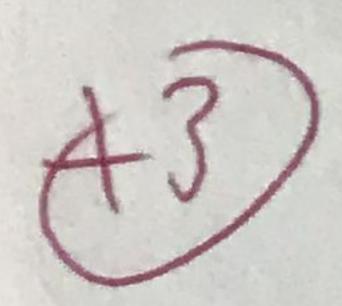
2. Find f''(x), the second derivative of $f(x) = x^2 e^x$ with respect to x. (Please factor e^x from the final answer).

$$4(x) = x^{2}e^{x}$$

$$4'(x) = x^{2}e^{x} + 2xe^{x} = e^{x}(x^{2} + 2x)$$

$$4''(x) = e^{x}(2x + 2x) + e^{x}(x^{2} + 2x)$$

$$4''(x) = e^{x}(x^{2} + 4x + 2)$$



3. Find the equation of the tangent line of the function $y = f(x) = e^x$ at x = 1. Express your answer in slope-intercept form.

Rt: (1,e')= (1,e)

Slope:

$$4'(x) = e^x$$

 $4'(1) = e' = e = n$

Line: y-e=e(x-1)