Math 115, Section 068 - Quiz 4 **Name:** _____
Due: 10/17/18

Write legibly, show work and indicate your final answers. This is graded based on effort. Again, show all of your work.

1. (9 *points*) Find the derivatives of the following functions using derivative rules:

   (a) $f(x) = \tan(x)\sin(x) + e^{-x}\cos(x)$

   Answer: $f'(x) =$ _____

   (b) $f(x) = \frac{\pi \tan(x)}{\sqrt{e}x^4}$

   Answer: $f'(x) =$ _____

   (c) $f(x) = \frac{\sin(x)\cos(x) - \tan(x)\cos(x)}{x^2 \sin(x)}$

   Answer: $f'(x) =$ _____

2. (9 *points*) Consider the function:

$$f(x) = x^3 e^x$$

For all of the following parts of this problem, leave your answers in exact form.

(a) For what interval(s) is $f(x)$ increasing?

Answer: _____

(b) For what interval(s) is $f(x)$ concave up?

Answer: _____

(c) Find the equation of the tangent to the graph at $x = -2$.

Answer: _____