Math 105 Quiz 4
§2.5-§2.7, 10/12/12
Name: KEY
Show all work for credit.

1. Find the derivative of $f(t) = 3cos(t) - \sqrt[3]{t^4} - 4^t + 2t^\pi - 4sin(t) - e^{6t} - 7 + \frac{ln(t)}{2}$.

$$f'(t) = -3sin(t) - \frac{4}{3}\sqrt[3]{t} - 4^t ln(4) + 2\pi t^{\pi-1} - 4sin(t) - 6e^t + \frac{1}{2t}$$

2. Find the antiderivative of $f(t) = 3cos(t) - \sqrt[3]{t^4} - 4^t + 2t^\pi - 4sin(t) - e^{6t} - 7 + \frac{1}{3t}$

$$F(t) = 3sin(t) - \frac{3}{7}t^{7/3} - \frac{4^t}{ln(4)} + \frac{2t^{\pi+1}}{\pi+1} - \frac{e^{6t}}{6} - 7t + \frac{1}{3}ln(t) + C$$

3. Find the equation of the tangent line to the function $e^{x/2} - 2sin(x)$ through $x = 0$.

$$\frac{d}{dx}(e^{x/2} - 2sin(x)) = 1/2e^{x/2} - 2cos(x)$$

At $x = 0$, the derivative is (1/2)*(1) - 2*cos(0) = 1/2-2 = -3/2.

The point is (0,1).

$$y - 1 = -(3/2)x \text{ or } y = -3x/2 + 1$$

4. Determine the solution to the IVP $y' = 4y$ where $y(0) = 2$.

$$y = Ae^{4x} \text{ solves } y' = 4y$$

The initial value, A, is 2.

$$y = 2e^{4x}$$