

Math 105 Quiz 5 Solutions

§2.5-§3.1

Name:

Show all work for credit.

1. Find the derivative of  $f(t) = 3\cos(t) - \sqrt[3]{t^5} - 4t + 2t^\pi - t^3e^{6t} - 7 + \frac{\ln(t)}{2}$ .

$$-3\sin(t) - \frac{5}{3}t^{2/3} - \ln(4)4t + 2\pi t^{\pi-1} - 3t^2e^{6t} - 6t^3e^{6t} + \frac{1}{2t}$$

2. Find the antiderivative of  $f(t) = 3\cos(t) - \sqrt[3]{t^5} - 4t + 2t^\pi - 4\sin(t) - e^{6t} - 7 + \frac{1}{3t}$ .

$$3\sin(t) - \frac{3}{8}t^{8/3} - \frac{4^t}{\ln(4)} + \frac{2t^{\pi+1}}{\pi+1} + 4\cos(t) - \frac{e^{6t}}{6} - 7t + \frac{1}{3}\ln(t) + C$$

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

$$y' = \frac{2\cos(x)e^{x/3} - (2/3)e^{x/3}\sin(x)}{e^{2x/3}}$$

$$y'(0) = \frac{2-0}{1} = 2, y(0) = 0$$

$$y = 2x$$

4. Determine the solution to the IVP  $y' = 6y$  where  $y(0) = 4$ .

$$y = 4e^{6x}$$