Quiz

Directions: Carefully read each question below and answer to the best of your ability in the space provided. You **MUST** show your work to receive full credit!

1. (5 points) Find the following indefinite integral:

$$\int \frac{4}{x} + e^x + 3x^2 \ dx.$$

Solution:

$$\int \frac{4}{x} + e^x + 3x^2 \ dx = \int \frac{4}{x} \ dx + \int e^x \ dx + \int 3x^2 \ dx$$
$$= 4\ln|x| + e^x + x^3 + C.$$

2. (5 points) Find the critical numbers of the function

$$g(x) = \frac{6x}{5x^2 + 80}.$$

Solution: The problem asks us to find the critical numbers. Remember, critical numbers are the values of x where $g'(x) = 0$ or $g'(x)$ doesn't exist. Thus, we need to take derivative of $g(x)$ first, that is

$$g'(x) = -\frac{6(x^2 - 16)}{5(x^2 + 16)^2} = -\frac{6(x - 4)(x + 4)}{5(x^2 + 16)^2}.$$

Since $5(x^2 + 16)^2 > 0$ for any x, thus we don't have a problem with dividing by 0. Thus, $g'(x)$ exists everywhere, and we need to find critical point where $g'(x) = 0$. Since $g'(x)$ is a rational function, then it's equal to 0 only when the numerator is equal to 0, that is $-6(x - 4)(x + 4) = 0$. Hence $x = 4$ and $x = -4$ are the only critical numbers(points).

Name: _____

Section (circle one):   021   022   023   024

Question:	1	2	Total
Points:	5	5	10
Score:			