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:

$$\int \frac{11x + x^2 e^x - 4x^5}{x^2} \, dx.$$

Solution:

$$\int \frac{11x + x^2 e^x - 4x^5}{x^2} \, dx = \int \left(\frac{11x}{x^2} + \frac{x^2 e^x}{x^2} - \frac{4x^5}{x^2} \right) \, dx$$

$$= \int \left(\frac{11}{x} + e^x - 4x^3 \right) \, dx$$

$$= \int \frac{11}{x} \, dx + \int e^x \, dx - \int 4x^3 \, dx$$

$$= 11 \ln|x| + e^x - x^4 + C.$$

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

$$g(x) = 5x e^{17x}.$$

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

$$g'(x) = 5e^{17x} + 5xe^{17x}17 = (85x + 5)e^{17x}.$$

Notice that we don't have any problems with dividing by 0. Thus, $g'(x)$ exists everywhere, thus we need to find critical points where $g'(x) = 0$. That is $(85x + 5)e^{17x} = 0$. Since $e^{17x} > 0$, then $85x + 5 = 0$ and $x = -\dfrac{1}{17}$ is the only critical number(point).

Name: _____

Section (circle one):   021   022   023   024

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