

1. (a) Evaluate the following indefinite integral. This is the problem I meant to include on the hard copy of your quiz.

$$\int \left( \frac{1}{x} - 8x^3 + \sqrt{x} + e^{2x} \right) dx =$$
$$\ln x - 2x^4 + \frac{2}{3}x^{3/2} + \frac{1}{2}e^{2x} + C$$

- (b) Evaluate the following indefinite integral. This is the problem I mistakenly gave on the hard copy of your quiz. Take derivatives to see that it is correct. For this course, don't worry if you can't evaluate  $\int \ln x \, dx$ .

$$\int \left( \ln x - 8x^3 + \sqrt{x} + e^{2x} \right) dx =$$
$$x \ln x - x - 2x^4 + \frac{2}{3}x^{3/2} + \frac{1}{2}e^{2x} + C$$

2. Find an explicit solution to the following initial value problem.

$$\frac{dw}{dt} = 6e^{3t}, \quad w(0) = 10$$

$$w = 2e^{3t} + 8$$

3. Find an explicit solution to the following initial value problem.

$$\frac{dP}{dt} = 0.5P, \quad P(0) = 60$$

$$P = 60e^{0.5t}$$

4. Find an explicit solution to the following initial value problem.

$$\frac{dq}{dr} = \frac{10r^4}{q} \quad q(0) = 3$$

$$q = \sqrt{4r^5 + 9}$$