Math 1B **Chapter 7 Pre-Test (Sec. 7.1 - 7.5)**

Name _____

Evaluate each using integration by parts.

1. $\int x^2 e^x \, dx$ **2.** $\int x^{-3} \ln x \, dx$ **3.** $\int e^{-x} \sin x \, dx$

Evaluate each trigonometric integral.

4. $\int (\sec x + \tan x)^2 \, dx$ **5.** $\int \cos^3 x \, dx$ **6.** $\int \sec^4 x \, dx$

Evaluate each using trigonometric substitution.

7. $\int \frac{1}{x^2\sqrt{4 - x^2}} \, dx$ **8.** $\int \frac{\sqrt{x^2 - 1}}{x} \, dx$

Find the partial fraction decomposition of each.

9. $\frac{2 - x}{x^3 + x^2}$ **10.** $\frac{3x + 7}{x^3 - x^2 + 4x - 4}$

The partial fraction decomposition of $\frac{x + 4}{x^3 + 4x}$ is $\frac{1}{x} + \frac{-x + 1}{x^2 + 4}$ Use this to evaluate the following integral

11. $\int \frac{x + 4}{x^3 + 4x} \, dx$

Here is #49 (altered slightly) from the Table of Integrals. Use a technique of integration to show that this is true.

12. $\int \frac{dx}{x(nx + k)} = \frac{1}{k} \ln \left| \frac{x}{nx + k} \right| + C$

Evaluate each using a familiar but unusual technique of integration.

13. $\int \frac{1}{2 - \sqrt{x}} \, dx$