

Differential Equations Review Assignment

Fall 2011

Instructions: Answer all questions to the best of your ability *without using a calculator*. Provide *all* solutions where appropriate.

1. Differentiate the following:

(a) $-\sin(3x)$

(b) xe^{x^2-1}

(c) $\arctan(x)$

(d) $\ln \sqrt{x}$

2. Factor completely $2x^3 - 3x^2 - 8x + 12$

3. Complete the square: $-2x^2 + 8x + 1$

4. Evaluate:

(a) $\lim_{x \rightarrow \infty} e^{-x}$

(b) $\lim_{x \rightarrow \infty} x \ln x$

(c) $\int x^3 - 3x^2 + 2 dx$

(d) $\int x\sqrt{x^2+1} dx$

(e) $\int x \cos x dx$

(f) $\int \frac{2x+1}{x^2+x-6} dx$

(g) $\int \frac{1}{9-x^2} dx$