Homework: DCT for Improper Integrals
Calculus II, Math 112

Name:_____

1. For each of the following integrals, use the Direct Comparison Test to determine if the integral converges or diverges. Show all work.

(a) $\displaystyle\int_1^\infty \frac{\cos^2(x)}{1+x^2}dx$

(b) $\displaystyle\int_1^\infty \frac{1}{\sqrt{x^3+1}}dx$

(c) $\displaystyle\int_1^\infty \frac{dx}{x+e^x}$

(d) $\displaystyle\int_1^\infty \frac{dx}{x+e^{2x}}$

(e) $\displaystyle\int_3^\infty \frac{dx}{x-e^{-x}}$

(f) $\displaystyle\int_1^\infty \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}}dx$

(g) $\displaystyle\int_1^\infty \frac{dx}{x+e^{2x}}$

(h) $\displaystyle\int_1^\infty \frac{1+3\sin^4(2x)}{\sqrt{x}}dx$

(i) $\displaystyle\int_1^\infty \frac{e^{-x}}{x}dx$

(j) $\displaystyle\int_1^\infty \frac{e^{-x^2}}{x}dx$

(k) $\displaystyle\int_0^\infty \frac{e^{-x^2}}{x}dx$

(l) $\displaystyle\int_0^{\frac{\pi}{2}} \frac{dx}{x\sin(x)}$