

EMT 121 - Worksheet VI

Improper Integrals

April 28, 2010

1. Determine if the following integrals are convergent or divergent. If the integral is convergent find the value.

(a) $\int_1^{\infty} \frac{1}{x} dx$

(b) $\int_1^{\infty} \frac{1}{x^2} dx$

(c) $\int_0^{\infty} \frac{1}{x^2} dx$

(d) $\int_{-\infty}^0 \frac{1}{\sqrt{3-x}} dx$

$$(e) \int_{-\infty}^{\infty} x e^{-x^2} dx$$

$$(f) \int_{-2}^{\infty} \sin x dx$$

$$(g) \int_0^3 \frac{1}{\sqrt{3-x}} dx$$

$$(h) \int_{-2}^3 \frac{1}{x^3} dx$$

2. Determine if the following integrals are convergent or divergent.

$$(a) \int_2^{\infty} \frac{\cos^2 x}{x^2} dx$$

$$(b) \int_3^{\infty} \frac{1}{x + e^x} dx$$

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

(d) $\int_1^{\infty} e^{-x^2} dx$

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