

EMT 121

Exam 2 - Practice

April 6, 2010

1. Evaluate.

(a) $\int_0^1 x \cos(ax) dx$

(b) $\int \frac{30}{x^2 - 25x + 100} dx$

(c) $\int \sec^3(\theta) \tan(\theta) d\theta$

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

(e) $\int \frac{2x-1}{2x^2-2x+3} dx$

(f) $\int \sqrt{e^3 x} dx$

(g) $\int \frac{x^{\frac{2}{3}}}{x+1} dx$

(h) $\int_1^2 x^5 \sqrt{2x^2+1} dx$

(i) $\int_0^5 \frac{1}{3+5x^2} dx$

2. Determine whether the following integrals converge or diverge. If the integral converges, evaluate it.

(a) $\int_0^{\infty} e^{-2x} dx$

(b) $\int_0^{\frac{\pi}{2}} \sec t \tan t dt$

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

3. Given the function f at the following values:

x	1.8	2.0	2.2	2.4	2.6
$f(x)$	3.12014	4.42569	6.04241	8.03014	10.46675

Approximate $\int_{1.8}^{2.6} f(x) dx$ using

(a) the Trapezoidal rule

(b) Simpson's rule

4. Use the Trapezium Rule with $n = 4$ to approximate $\int_1^2 x \ln x \, dx$