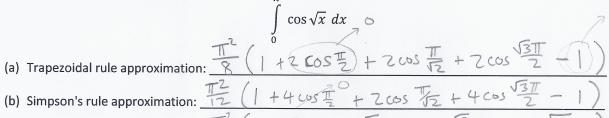
MATH 202 Quiz 9 - Version B

November 3, 2015

ANSWERS

Instructions: No calculators! Use your own scrap paper and write your answers in the space provided.

1. For the given integral, use n = 4 to approximate it using the indicated technique:



COST

- (c) Midpoint rule approximation: $\frac{\mathbb{T}^2}{4} \left(\cos \frac{\mathbb{T}}{\sqrt{8}} + \cos \frac{\mathbb{T}}{\sqrt{8}} + \cos \frac{\mathbb{T}}{\sqrt{8}} + \cos \frac{\mathbb{T}}{\sqrt{8}} + \cos \frac{\mathbb{T}}{\sqrt{8}} \right)$
- 2. For the above approximations, what is the error associated with:

2. For the above approximations, what is the error associated with:

(a) The Trapezoidal rule:
$$E_T = \frac{\sqrt{15}/24n^2}{\sqrt{24n^2}}$$

(b) The Midpoint rule: $E_M = \frac{\sqrt{16}/24n^2}{\sqrt{25kT6}}$

3. How large must n be to have an approximation to with 0.01 accuracy using the Trapezoidal rule?

 $n > \frac{\sqrt{15}/24n^2}{\sqrt{25kT6}} = 5T^3/\frac{15}{3}$

4. If the integral below converges, find its value. If it diverges, state so:

(a)
$$\int_{-\infty}^{\infty} \frac{x^2}{4 + x^6} dx = \frac{1}{6}$$
 (b) $\int_{0}^{1} \frac{\ln x}{\sqrt{x}} dx = \frac{4}{6}$ (c) $\int_{0}^{\infty} x^3 \ln x dx = \frac{4 \ln 2 - 1}{6}$ (d) $\int_{0}^{\infty} x^3 e^{-x^4} dx = \frac{1}{6}$

5. Use the comparison theorem to determine if the integral converges or diverges:

(a)
$$\int_{1}^{\infty} \frac{x+2}{\sqrt{x^4-2x}} dx$$

This integral converges/diverges (circle one). I compared it to: _______________________________(state an integral)

(b)
$$\int_{0}^{\infty} \frac{\arctan x}{3 + e^{x}} dx$$
This integral converges diverges (circle one). I compared it to: _______ (state an integral)

Bonus:

1. Compute the area between the two given curves:

(a)
$$y = x$$
 and $y = x^2$.

Integral set up: _____ Area: _____