

## MAC 2312 Calculus II, Worksheet #7

Date: \_\_\_\_\_

Name: \_\_\_\_\_

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For Problems 1-3, use (a) Trapezoidal Rule, (a) Midpoint Rule and (c) Simpson's Rule to approximate the given integral with the specified  $n$  value.

Q1)  $\int_1^3 \sqrt{x^3 - 1} dx$  with  $n = 10$

Q2)  $\int_0^2 \frac{e^x}{1+x^2} dx$  with  $n = 10$

Q3)  $\int_{-1}^1 e^{e^x} dx$  with  $n = 10$

For problems 4 - 6, determine whether each integral is convergent or divergent.

Q4)  $\int_0^{\infty} \frac{x^2}{(1+x^3)} dx$

Q5)  $\int_1^{\infty} \frac{e^{-\sqrt{x}}}{\sqrt{x}} dx$

Q6)  $\int_{-\infty}^{\infty} \frac{x^2}{9+x^6} dx$

Q7) Let  $g(x) = \frac{\sin^2 x}{x^2}$  and let  $f(x) = \frac{1}{x^2}$ . Use Comparison Theorem with  $f(x) = \frac{1}{x^2}$  to show that  $\int_1^{\infty} g(x) dx$  is convergent.