

MATH 22 PRACTICE EXAM ON IMPROPER INTEGRALS

Name:

Section:

Instructions:

- (1) Books, notes, and calculators are not permitted.
- (2) Simplify as instructed. On some problems, unsimplified correct answers will not receive full credit.
- (3) Show your work as instructed. On some problems, correct answers without justification will not receive full credit.

(1)

(2)

(3)

(4)

(5)

Total

Problem 1. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

The definite integral

$$\int_{-1}^1 \frac{1}{x^2} dx$$

is equal to which of the following?

A. -2 .

B. 0 .

C. 1 .

D. 2 .

E. None of these.

Problem 2. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

The definite integral

$$\int_0^{\infty} e^{-x} dx$$

is equal to which of the following?

A. 0 .

B. 1 .

C. e .

D. ∞ .

E. None of these.

Problem 3. (15 pts.) Decide whether the integral

$$\int_0^{\infty} \frac{1}{x^2 + \sqrt{x}} dx.$$

converges or diverges. Explain your reasoning.

Problem 4. (15 pts.) Decide if the improper integral

$$\int_{10}^{\infty} \frac{\ln(x)}{x} dx$$

converges or diverges. Explain your reasoning.

Problem 5. (15 pts.) Evaluate the improper integral

$$\int_0^1 \frac{x-1}{\sqrt{x}} dx$$

or explain why it diverges. Show your work and/or simplify your answer.

Problem 6. (15 pts.) Evaluate the improper integral

$$\int_{-1}^1 \frac{1}{x^2 - 2x} dx$$

or explain why it diverges. Show your work and/or simplify your answer.

Problem 7. (15 pts.) Evaluate the improper integral

$$\int_{-1}^1 \frac{1}{\sqrt{|x|}} dx$$

or explain why it diverges. Show your work and/or simplify your answer.