

READING ASSIGNMENT 10  
§8.7 (Improper Integrals)

NAME: \_\_\_\_\_  
Due 18 July 2018

LEARNING OBJECTIVES

By the end of this lesson, you will be able to:

- Compute an improper integral as a limit of proper integrals.
- Use the comparison test to determine whether an improper integral converges or diverges.

REVIEW

- Review L'Hôpital's rule: if  $\frac{f(x)}{g(x)}$  is one of the indeterminate forms  $\frac{0}{0}, \frac{\infty}{\infty}, \dots$ , then

$$\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \lim_{x \rightarrow a} \frac{f'(x)}{g'(x)}.$$

READING

- Read section 8.7

QUESTIONS

- (1) Use the definition of improper integrals to rewrite the improper integrals below as limits of proper integrals.

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

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

- (2) When using the comparison test to determine convergence or divergence of improper integrals, we almost always compare to a particular class of improper integral called the p-integrals. For each of the improper integrals below, which p-integral should we compare it to in order to determine convergence or divergence?

(a)  $\int_1^{\infty} \frac{1}{\sqrt{x^3+1}} dx$

(b)  $\int_0^{\frac{1}{2}} \frac{1}{x^8+x^2} dx$