

Name:

Section: 5 6 9 10

1. Find $\int_0^1 \frac{1}{x^4} dx$. *improper*

$$= \lim_{t \rightarrow 0^+} \int_t^1 \frac{1}{x^4} dx$$

$$= \lim_{t \rightarrow 0^+} \left. \frac{x^{-3}}{-3} \right|_t^1$$

$$= \lim_{t \rightarrow 0^+} \left[-\frac{1}{3} + \frac{1}{3t^3} \right] = \infty$$

2. Find the limit of the sequence $\left\{ \frac{(-1)^n}{n^3} \right\}$.

$$-\frac{1}{n^3} \leq \frac{(-1)^n}{n^3} \leq \frac{1}{n^3}$$

$$\Rightarrow \lim_{n \rightarrow \infty} \frac{(-1)^n}{n^3} = 0 \text{ by squeeze theorem.}$$