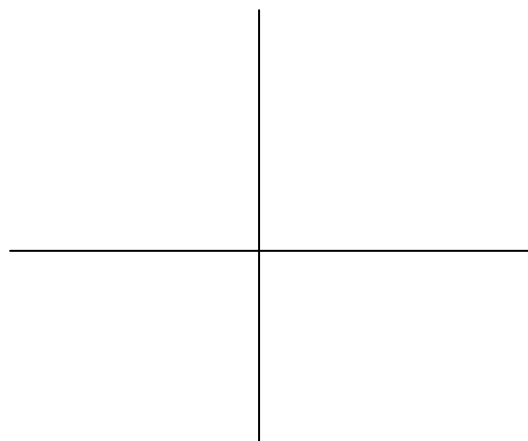
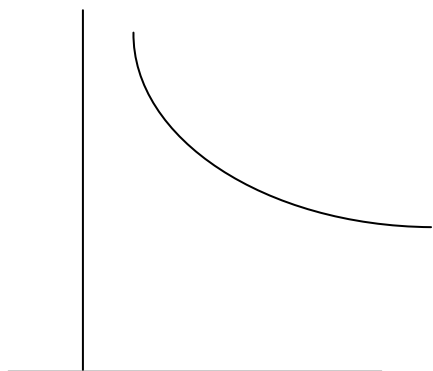


Calculus BC

Section 8.8 - Improper Integrals



$$f(x) = \frac{1}{x}$$

$$g(x) = \frac{1}{\sqrt{1-x^2}}$$

does $\int_0^1 f(x) dx$ exist?

does $\int_0^1 g(x) dx$ exist?

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

-note that $g(x)$ is not defined for $x = 1$
-need to rewrite integral

$$= \lim_{b \rightarrow 1^-} \int_0^b \frac{1}{\sqrt{1-x^2}} dx$$

-integrate as normal

Integral ____verges since the answer is _____.

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

-note that $f(x)$ is not defined for $x = 0$

-need to rewrite integral

-integrate as normal

Integral ____verges since the answer is _____.

$$3. \int_0^{\infty} \frac{dx}{(1+x)\sqrt{x}}$$

-function is undefined at _____
 - rewrite integral

Given f and g integrable over $[a, b]$ and $0 \leq g(x) \leq f(x)$

if $\int_a^{\infty} f(x)dx$ converges then $\int_a^{\infty} g(x)dx$ _____

if $\int_a^{\infty} g(x)dx$ diverges then $\int_a^{\infty} f(x)dx$ _____