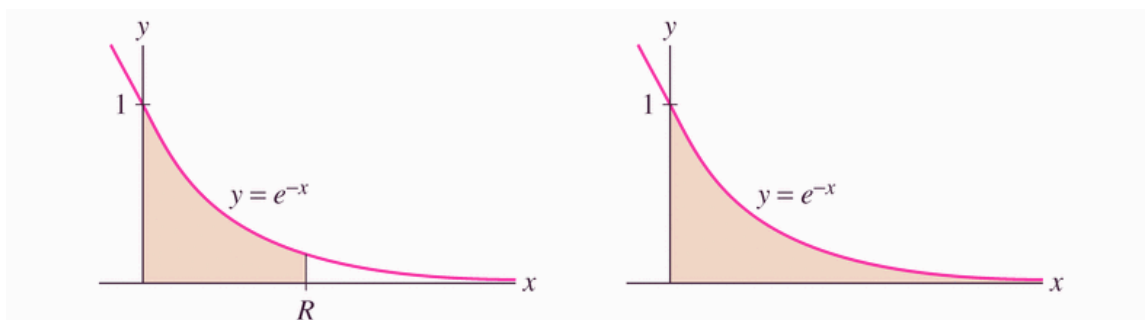# Improper Integral Handout

(A) Finite region has area $1 - e^{-R}$. (B) Infinite region has area 1.

FIGURE 2 The area under $y = e^{-x}$ for $0 \leq x \leq R$ approaches the limit 1 as $R \to \infty$.
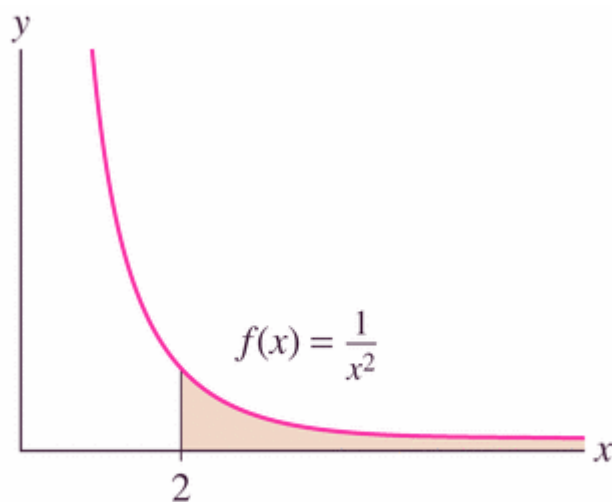

$$f(x) = \frac{1}{x^2}$$

FIGURE 3 The area over $[2, \infty)$ is equal to $\frac{1}{2}$.

This figure illustrates two kinds of improper integrals, actually. The region in grey, and the region in white. Let's see if either is defined (claim is that the grey one exists, and is equal to ½).

#68, p. 552

#57, p. 552