

$$3) \lim_{x \rightarrow \frac{3}{4}\pi} \frac{\tan(\pi - x)}{e^{\pi - x}} = ? \quad \frac{\tan(\frac{3}{4}\pi)}{e^{\frac{3\pi}{4}}} = \frac{-1}{e^{\frac{3\pi}{4}}}$$

$$4) \lim_{x \rightarrow \infty} (x^2 + 1)^{\frac{1}{x}} = ? \quad \lim_{x \rightarrow \infty} \exp\left[\frac{\ln(x^2 + 1)}{x}\right] = \exp\left[\lim_{x \rightarrow \infty} \frac{\ln(x^2 + 1)}{x}\right]$$

$$\stackrel{\infty^0}{=} \lim_{L'H} \exp\left[\lim_{x \rightarrow \infty} \frac{2x}{x^2 + 1}\right] = \exp\left[\lim_{x \rightarrow \infty} \frac{2}{x + \frac{1}{x}}\right] = e^0 = 1$$

V. (10 points). What is the natural domain of the function $f(x) = \log(x^2 - 25)$? I.e., for what values of x does $f(x) = \log(x^2 - 25)$ make sense?

$$x^2 - 25 > 0 \quad \text{so} \quad x^2 > 25$$

$$|x| > 5$$

OR

$$(-\infty, -5) \cup (5, \infty)$$

VI. (10 points.) The function $y = f(x)$ is graphed below. What is the numerical value of $(f^{-1})'(2)$?

