

Worksheet 9/24/2024

1) Find the vertical and horizontal asymptotes (if any) of the given functions.

a) $f(x) = \frac{x^2+1}{x^2+3x+2}$

b) $f(x) = \frac{x^2-1}{x^2+3x+2}$

c) $f(x) = \frac{x^2}{x^3-x^2-x+1}$

d) $f(x) = \frac{x^3}{x^2+1}$

2) Find the given limits.

a) $\lim_{x \rightarrow -\infty} (\sqrt{x^2 + 4} - x)$

b) $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 4} - x)$

$$\text{c) } \lim_{x \rightarrow \infty} \frac{e^{3x} + e^x}{2e^{3x} - e^{2x}}$$

$$\text{d) } \lim_{x \rightarrow -\infty} \frac{e^{3x} + e^x}{2e^{3x} - e^{2x}}$$

$$\text{e) } \lim_{x \rightarrow \infty} (\ln(x^2 + 1) - 2 \ln(3x - 5))$$