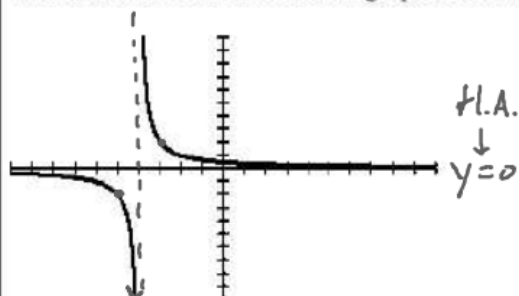


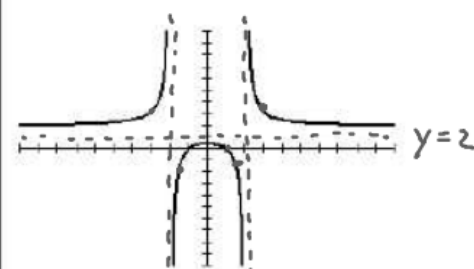
Evaluate the limit based on the graph of f shown



a) $\lim_{x \rightarrow -4^-} f(x) = -\infty$
 $f(-5) < 0$

Right side of V.A.
 b) $\lim_{x \rightarrow -4^+} f(x) = \infty$
 $f(-3) > 0$

c) $\lim_{x \rightarrow -\infty} f(x) = 0$ Horizontal Asymptote d) $\lim_{x \rightarrow \infty} f(x) = 0$



a) $\lim_{x \rightarrow -2^-} f(x) = \infty$
 $f(-3) =$

b) $\lim_{x \rightarrow -2^+} f(x) = -\infty$
 $f(-1.9) < 0$

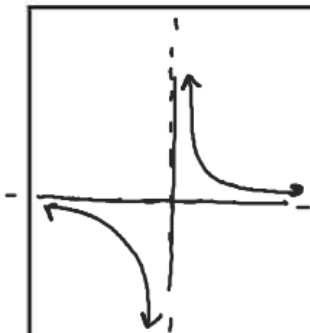
c) $\lim_{x \rightarrow 2^-} f(x) = -\infty$
 $f(1.5) < 0$

d) $\lim_{x \rightarrow 2^+} f(x) = \infty$
 $f(2) > 0$

e) $\lim_{x \rightarrow -\infty} f(x) = 2$

H.A. →

f) $\lim_{x \rightarrow \infty} f(x) = 2$



Find the domain of the function f . Use limits to describe the behavior of f at values of x not in the domain.

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

$D: (-\infty, 0) \cup (0, \infty)$

$f(-.5) = \frac{1}{-.5} < 0$

$f(.5) = \frac{1}{.5} > 0$

$\lim_{x \rightarrow 0^-} f(x) = -\infty$ $\lim_{x \rightarrow 0^+} f(x) = \infty$

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

$D: (-\infty, 2) \cup (2, \infty)$

$f(-2.5) = \frac{1}{-2.5-2} < 0$

$f(2.5) = \frac{1}{2.5-2} > 0$

$\lim_{x \rightarrow 2^-} f(x) = -\infty$ $\lim_{x \rightarrow 2^+} f(x) = \infty$

$(x+3)(x-3) = 0$

$x+3=0$ $x-3=0$
 $x=-3$ $x=3$

C) $f(x) = \frac{4}{x^2-9}$

$D: (-\infty, -3) \cup (-3, 3) \cup (3, \infty)$

$\lim_{x \rightarrow -3^-} f(x) = \infty$

$f(-4) = \frac{4}{16-9} > 0$

$\lim_{x \rightarrow -3^+} f(x) = -\infty$

$f(-4) = \frac{4}{4-9} < 0$

$\lim_{x \rightarrow 3^-} f(x) = -\infty$

$f(2.5) = \frac{4}{6.25-9} < 0$

$\lim_{x \rightarrow 3^+} f(x) = \infty$

$f(3.5) = \frac{4}{12.25-9} > 0$

Describe how the graph of the given function can be obtained by transforming the graph of the reciprocal/inverse function. Identify the horizontal and vertical asymptotes and use limits to describe the corresponding behavior. Sketch the graph of the function.

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

b) $f(x) = \frac{3x-7}{x-2}$

<p>V.A. set bottom equal to zero.</p> $x^2 + 2x = 0$ $x(x+2) = 0$ $x=0 \quad x+2=0$ <p>V.A. $x=0, -2$</p>	<p>Find the horizontal and vertical asymptotes of $f(x)$. Use limits to describe the corresponding behavior.</p> <p>No V.A. H.A. $y=5$</p> <p>a) $f(x) = \frac{5x^2}{x^2+2}$</p> $x^2 + 2 = 0$ $x^2 = -2$ $x = \pm\sqrt{-2}$ <p>No Real solution</p> <p>b) $f(x) = \frac{x+5}{x^2+2x}$</p> $\lim_{x \rightarrow -2^-} f(x)$ $\lim_{x \rightarrow -2^+} f(x)$ <p>Find the end behavior asymptote</p> <p>a) $f(x) = \frac{2x^2+2x-3}{x+3}$</p> <p>b) $f(x) = \frac{x^3+1}{x-1}$</p> $\lim_{x \rightarrow \pm\infty} f(x) = 5$ $\lim_{x \rightarrow 0^-} f(x)$ $\lim_{x \rightarrow 0^+} f(x)$
--	--