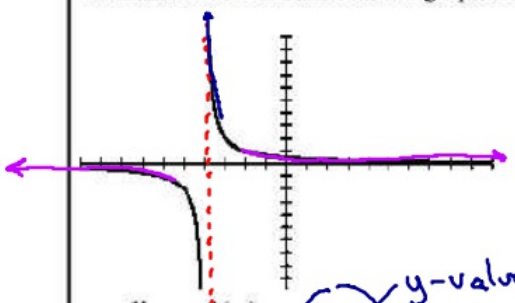
Evaluate the limit based on the graph of f shown



$x=-4$ VA

The limits either approach $+\infty$ or $-\infty$

a) $\lim_{x\to -4^-} f(x) =$ y-values

$\lim_{x\to -4^-} f(x) = -\infty$

$x\to -4^-$ ↑ Left

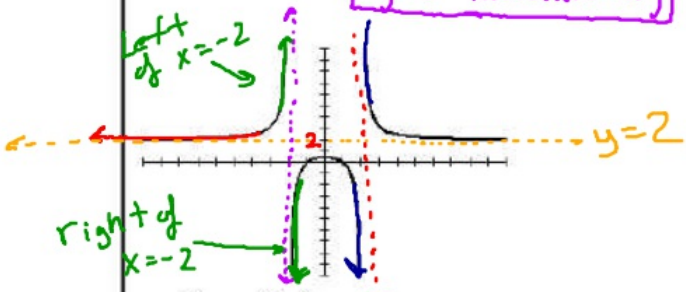
b) $\lim_{x\to -4^+} f(x) = \infty$

↑ right side of $x=-4$

c) $\lim_{x\to -\infty} f(x) = 0$ ← End Behavior → d) $\lim_{x\to \infty} f(x) = 0$

$x\to -\infty$

$y=0$ Horizontal Asy




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

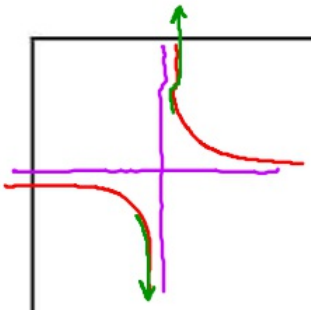
b) $\lim_{x\to -2^+} f(x) = -\infty$

c) $\lim_{x\to 2^-} f(x) = -\infty$

d) $\lim_{x\to 2^+} f(x) = \infty$

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

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



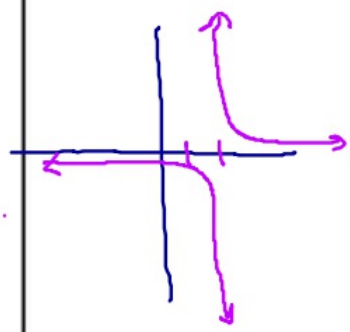
Find the domain of the function f. Use limits to describe the behavior of f at values of x not in the domain.

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

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

$x \neq 0$ - VA

Domain $(-\infty,0)\cup(0,\infty)$



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

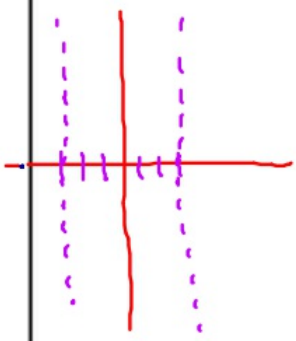
$\lim_{x\to 2^-} f(x) = -\infty$

$x-2=0$

$x=2$ VA

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

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



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

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

$x^2-9=0$

$\sqrt{x^2}=\sqrt{9}$

$x=\pm 3$ VA

$x=2.9$ $y=\frac{4}{2.9^2-9}$ $y=\frac{4}{\text{neg}}$

$x=3.1$ $y=\frac{4}{3.1^2-9}$ $y=\frac{4}{+}$

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

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

$x=-3.1$ $f(3.1)=\frac{4}{3.1^2-9}$ $y=\frac{4}{+}$ $y=+$

$x=-2.9$ $y=\frac{4}{(-2.9)^2-9}$ $y=\frac{4}{\text{neg}}$ $y=\text{neg}$