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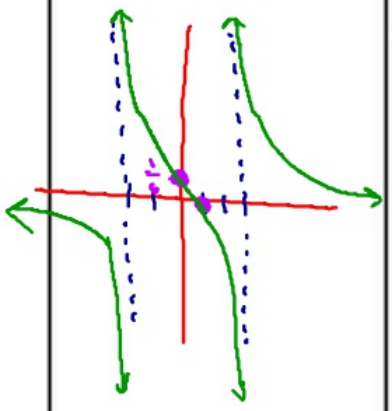
Find the asymptotes and intercepts of the function and graph the function

a) $f(x)=\frac{x-1}{x^2-x-6}$ $=\frac{x-1}{(x+2)(x-3)}$

x-int: set the numerator = 0



x-int: $(y=0) \rightarrow f(x)=0$

$(x^2-x-6)\,0=\frac{x-1}{x^2-x-6}(x^2-x-6)$

$0=x-1$

$x=1$ x-int

HA: $y=0$

VA: $x^2-x-6=0$

$(x+2)(x-3)=0$

$x=-2 \quad x=3$

y-int: $(x=0)$

$f(0)=\frac{0-1}{0^2-0-6}=\frac{-1}{-6}=\frac{1}{6}$ y-int

$f(-1.9)=\frac{-2.9}{(.1)(-4.9)}=+$

$f(-2.1)=\frac{-3.1}{(-.1)(-5.1)}=-$

b) $f(x)=\frac{1}{x^3-16x}$

$f(x)=\frac{1}{x(x+4)(x-4)}$

HA: $y=0$

VA: $x^3-16x=0$

$x(x^2-16)=0$

$x=0 \quad x^2-16=0$

$x^2=16$

$x=\pm 4$

x-int: $1\neq 0$

No x-int

y-int: $\frac{1}{0}$ UND

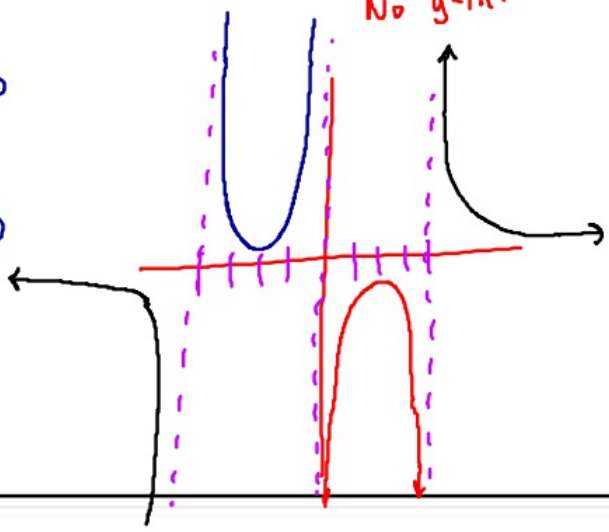
No y-int

$f(-4.1)=\frac{1}{(-)(-)(-)}=-$

$f(-3.9)=\frac{1}{(-)(+)(-)}=+$

$(-3.9)(.1)(-7.9)$

$f(.1)=\frac{1}{(+)(+)(-)}=-$



Find the asymptotes and intercepts of the function and graph the function

c) $f(x)=\dfrac{2x^2-2}{x^2-4}$

$f(1.9) = 2.9 + \dfrac{-3}{-.1} = +$

d) $f(x)=\dfrac{x^2-x-5}{x-2} = X + 1 + \dfrac{-3}{x-2}$ → HA: $\lim_{x\to\pm\infty} f(x) = 0$

HA: NONE VA: $x=2$

End Behavior Asy (Slant asy): $y=1x+1$ → y-int = 1, slope = 1

VA → 2 | 1 −1 −5

2 +2

1 +1 | −3

x term, constant

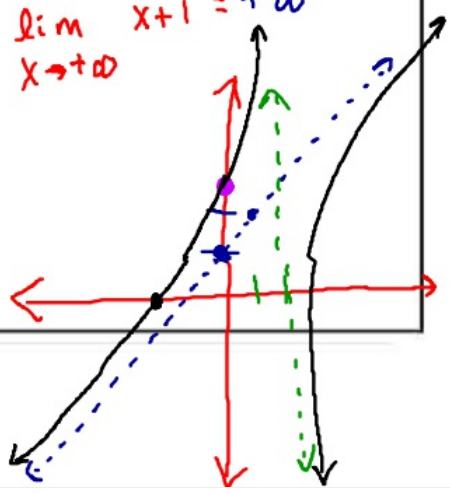
$\lim_{x\to-\infty} x+1 = -\infty$

$\lim_{x\to+\infty} x+1 = +\infty$

y-int: $=\frac{5}{2}=2.5$

x-int: $x^2-x-5=0$

$\frac{1}{2} \pm \frac{\sqrt{1-4(1)(-5)}}{2}$



 $\frac{1}{2} \pm \frac{\sqrt{21}}{2}$