Find the horizontal and vertical asymptotes of f(x). Use limits to describe the corresponding behavior.

a) $f(x)=\frac{5x^2}{x^2+2}$

b) $f(x)=\frac{x+5}{x^2+2x}$

Find the end behavior asymptote

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

$-3 \mid 2 \quad 2 \quad -3$

$\quad\quad -6 \quad 12$

$2 \quad -4 \mid 9$

$y=2x-4$

$\lim_{x\to\infty} = \infty \qquad \lim_{x\to-\infty} = -\infty$

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

$1 \mid 1 \quad 0 \quad 0 \quad 1$

$\quad\quad 1 \quad 1 \quad 1$

$1 \quad 1 \quad 1 \mid 2$

$y=x^2+x+1$

V.A. Set bottom equal to zero

H.A. Compare degrees

X-intercept: Set top equal to zero

Y-intercept: Let x=0

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

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

V.A. $x^2-x-6=0$

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

$x=3,-2$

H.A. $y=0$

X-intercept

$x-1=0$

$x=1$

Y-intercept

$\frac{0-1}{0^2-0-6}=\frac{-1}{-6}=\frac{1}{6}$

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

V.A. $x^3-16x=0$

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

$x(x-4)(x+4)=0$

$x=0,-4,4$

H.A. $y=0$

X-intercept

$1\neq 0$

No X-intercept

Y-intercept

$\frac{1}{0^3-16(0)}=\frac{1}{0}$

No Y-intercept

Undefined

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

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

V.A.

$x^2-4=0$

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

$x=\pm 2$

H.A. $y=2$

x-intercept

$2x^2-2=0$

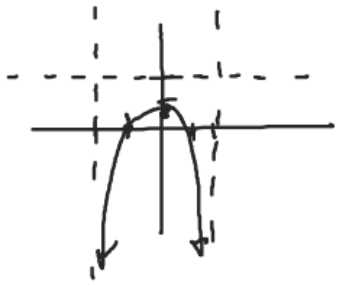
$2x^2=2$

$x^2=1$

$x=\pm 1$

y-intercept

$\frac{2(0)^2-2}{0^2-4}=\frac{2}{4}=\frac{1}{2}$



d) $f(x)=\frac{x^2-x-5}{x-2}$

V.A.

$x-2=0$

$x=2$

H.A. None

2	1	-1	-5
		2	2
	1	1	~~-3~~

S.A. $y=x+1$

x-intercepts

$x^2-x-5=0$

$5\frac{1}{4}$

$x^2-x+\frac{1}{4}=5+\frac{1}{4}$

$\sqrt{\left(x-\frac{1}{2}\right)^2}=\sqrt{\frac{21}{4}}$

$x-\frac{1}{2}=\pm\frac{\sqrt{21}}{2}$

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

y-intercepts

$\frac{0^2-0-5}{0-2}=\frac{5}{2}$