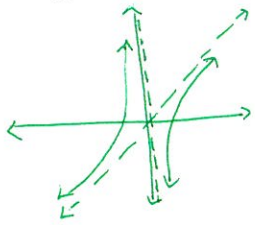
Pre-Calculus **HW#2.6-2** **Name:** Key

Find the asymptotes and graph.

1. $f(x)=\dfrac{x^2-1}{x}$

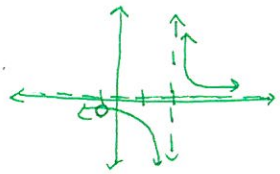
H: NONE
V: $x=0$
HOLES: NONE
SLANT: $y=x$

$$x\overline{)\,x^2-1}\quad x$$
$$-x^2$$
$$-1$$



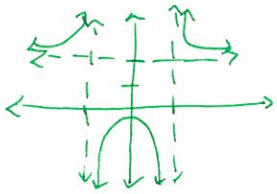
2. $f(x)=\dfrac{x+1}{2x^2-2x-4}=\dfrac{x+1}{2(x+1)(x-2)}$

H: $y=0$
V: $x=2$
HOLES: $x=-1$
SLANT: NONE



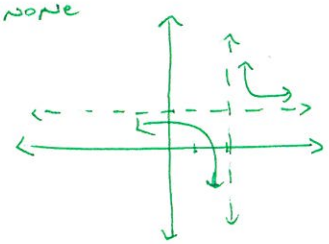
3. $f(x)=\dfrac{4x^2}{2x^2-2}=\dfrac{4x^2}{2(x-1)(x+1)}$

H: $y=2$
V: $x=1,\ x=-1$
HOLES: NONE
SLANT: NONE



4. $f(x)=\dfrac{x^3}{x^3-8}=\dfrac{x^3}{(x-2)(x^2+2x+4)}$

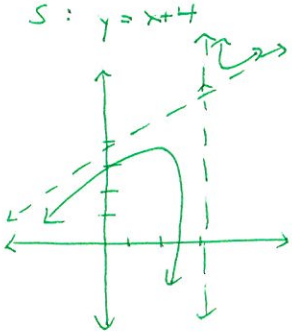
H: $y=1$
V: $x=2$
HOLES: NONE
S: NONE



5. $f(x)=\dfrac{x^2+x-6}{x-3}=\dfrac{(x+3)(x-2)}{x-3}$

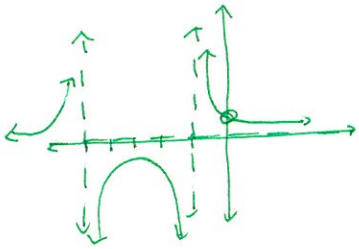
H: NONE
V: $x=3$
HOLE: NONE
S: $y=x+4$

$$3\ \big|\ 1\ \ 1\ \ -6$$
$$\qquad\ \ 3\ \ 12$$
$$\qquad 1\ \ 4\ \ 6$$



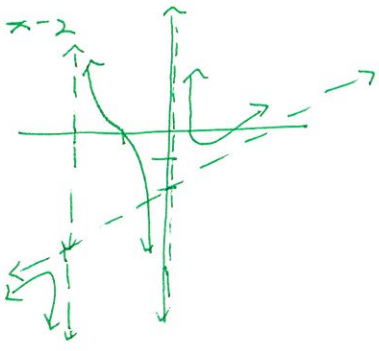
6. $f(x)=\dfrac{2x}{x^3+6x^2+5x}=\dfrac{2x}{x(x+5)(x+1)}$

H: $y=0$
V: $x=-5,\ x=-1$
HOLE: $x=0$
S: NONE



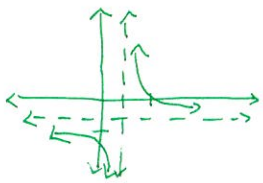
7. $f(x)=\dfrac{x^3+1}{x^2+2x}=\dfrac{(x+1)(x^2-x+1)}{x(x+2)}$

H: NONE
V: $x=0,\ x=-2$
HOLE: NONE
S: $y=x-2$



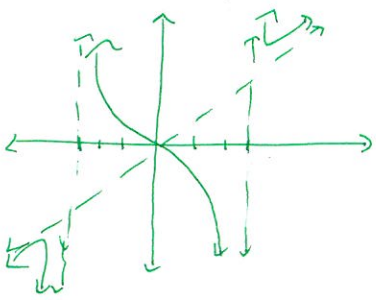
8. $f(x)=\dfrac{-3x+7}{5x-2}$

H: $y=\dfrac{-3}{5}$
V: $x=\dfrac{2}{5}$



9. $f(x)=\dfrac{x^3-1}{x^2-9}=\dfrac{(x-1)(x^2+x+1)}{(x-3)(x+3)}$

H: NONE
V: $x=3,\ x=-3$
HOLE: NONE
S: $y=x$



Write an equation of a rational function, $f(x)=\frac{p(x)}{q(x)}$, having the indicated properties.

10. V: x=3
H: y=0

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

11. V: x=2, x=-2
H: y=2
Holes: x=1

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

12. V: x=1
Slant: y=x

1	1	-1	2
		1	0
	1	0	2

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

13. no asymptotes
Hole: x=4

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