

Rational Functions and Asymptotes.

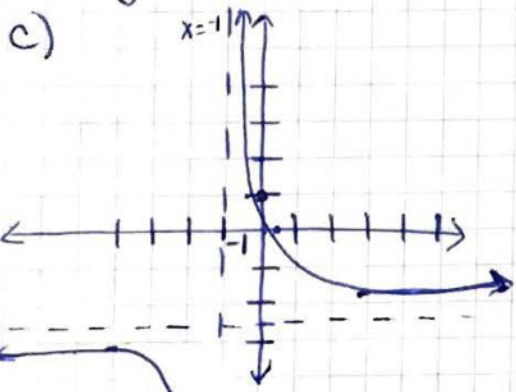
Sec 2.6 part 2 pg 195 #16, 18, 29, 40-43

#16) $f(x) = \frac{2-5x}{2+2x}$ $2+2x \neq 0$
 $2x \neq -2$
 $x \neq -1$

a) $\{x \in \mathbb{R} \mid x \neq -1\}$

b) Vertical asy (zeros)
 $x = -1$

-Horizontal asy.
 $y = -\frac{5}{2} = -2.5$



d)

x	y
0	1
0	0
-2	-6

#29) $f(x) = 1 - \frac{2}{x-5}$
 $= \frac{x-5-2}{x-5}$
 $= \frac{x-7}{x-5}$

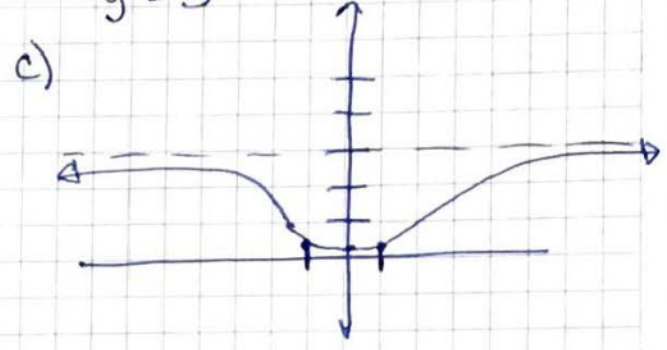
The zeros of $f(x)$ correspond to the zeros of the numerator and is $x=7$.

#18) $f(x) = \frac{3x^2+1}{x^2+x+9}$ $x \neq \frac{-1 \pm \sqrt{1^2 - 4(1)(9)}}{2(1)}$
 $x \neq \frac{-1 \pm i\sqrt{35}}{2}$
imaginary

a) $\{x \in \mathbb{R}\}$

b) Vertical Asy (zero)
none

Horizontal Asy. (deg. num. = deg. den.)
 $y = 3$



d)

x	y
0	0
-1	.44
1	.36

Possible answers for #40-43

#40) Vertical asy. $x = -2, x = 1$

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

#41) Vertical asy: none & horiz: $y = 0$

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

#42) Vertical asy: None & Horiz asy: $y = 2$

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

#43) Vertical asy: $x = 0, x = \frac{5}{2}$
Horizontal asy: $y = -3$

$f(x) = \frac{-6x^2}{x(2x-5)} \Rightarrow \frac{-6x^2}{2x^2-5x}$