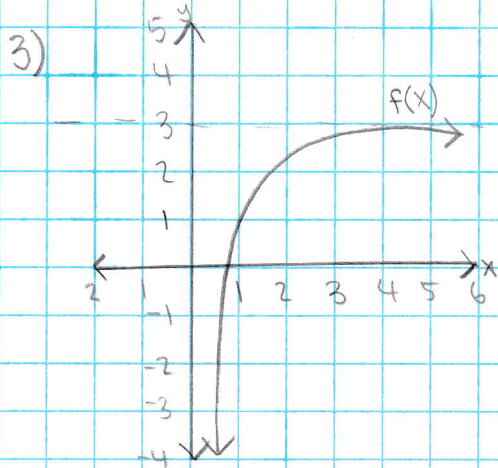


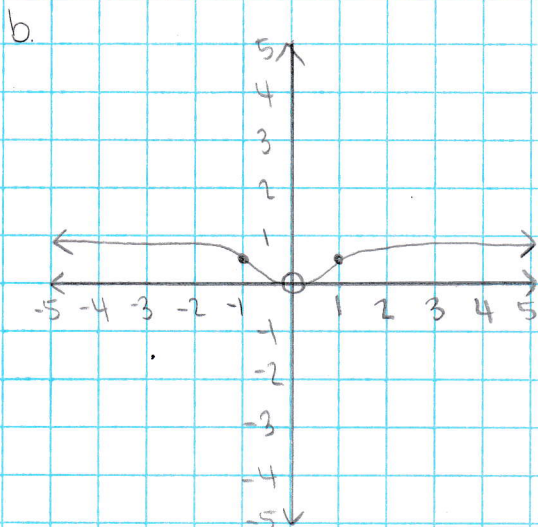
# 2.7 # 3, 5, 7, 9, 15, 19, 21, 23, 25, 29, 33, 35 & 37



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

a.

x	f(x)
-1000	0.9999990
-500	0.999996
-100	0.99990
-50	0.9996
50	0.9996
100	0.99990
500	0.999996
1000	0.9999990



c. Horizontal Asymptote  
@  $y=0$ .

7)  $\lim_{x \rightarrow \infty} \frac{x}{x+9} = \lim_{x \rightarrow \infty} \frac{x}{x} = 1$

9)  $\lim_{x \rightarrow \infty} \frac{3x^2+20x}{2x^4+3x^3-29} = \lim_{x \rightarrow \infty} \frac{3x^2}{2x^4}$   
 $= \lim_{x \rightarrow \infty} \frac{3}{2x^2}$   
 $= 0$

15)  $\lim_{x \rightarrow -\infty} \frac{3x^3-10}{x+4} = \lim_{x \rightarrow -\infty} \frac{3x^3}{x}$   
 $= \lim_{x \rightarrow -\infty} 3x^2$   
 $= \infty$  (DNE)

19)  $f(x) = \frac{\sqrt{36x^2+7}}{9x+4}$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{36x^2+7}}{9x+4} = \lim_{x \rightarrow \infty} \frac{\sqrt{36x^2}}{9x}$$

$$= \lim_{x \rightarrow \infty} \frac{6|x|}{9x}$$

$$= \lim_{x \rightarrow \infty} \frac{2x}{3x}$$

$$= \frac{2}{3}$$

$$\lim_{x \rightarrow -\infty} \frac{\sqrt{36x^2+7}}{9x+4} = \lim_{x \rightarrow -\infty} \frac{\sqrt{36x^2}}{9x}$$

$$= \lim_{x \rightarrow -\infty} \frac{6|x|}{9x}$$

$$= \lim_{x \rightarrow -\infty} \frac{6(-x)}{9x}$$

$$= -\frac{2}{3}$$

$f(x)$  has a horizontal asymptote at  $y = \frac{2}{3}$  to the right and  $y = -\frac{2}{3}$  to the left.

21)  $f(t) = \frac{3^t}{1+3^{-t}} = \frac{3^t}{1+\frac{1}{3^t}}$

$$\lim_{t \rightarrow \infty} \frac{3^t}{1+\frac{1}{3^t}} = \infty$$

$$\lim_{t \rightarrow -\infty} \frac{3^t}{1+\frac{1}{3^t}} = 0$$

$f(t)$  has a horizontal asymptote at  $y=0$  to the left.

