

Graphs of Rational Functions

Sec 2.7 Part 1 pg 204 #15, 21, 23, 25, 27

#15) $C(x) = \frac{5+2x}{1+x}$

Vertical Asy = $x = -1$

Horizontal Asy $y = 2$
(Deg num = Deg den)

X-int ($y=0$)

$$0 = \frac{5+2x}{1+x}$$

$$0 = 5+2x$$

$$-5 = 2x$$

$$-\frac{5}{2} = x$$

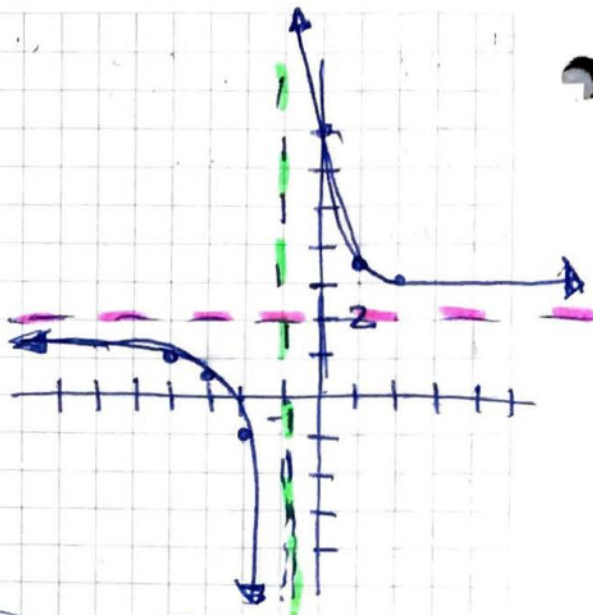
$$(-\frac{5}{2}, 0)$$

Y-int ($x=0$)

$$y = \frac{5}{1}$$

$$(0, 5)$$

x	y
-4	1
-3	$\frac{1}{2}$
-2	-1
0	5
1	$\frac{7}{2} = 3.5$
2	3



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

Vertical Asy: $x = 2, x = -2$

$$x^2 - 4 = 0$$

$$x^2 = 4$$

$$x = \pm 2$$

Horiz. Asy (Deg num = Deg den)

$$y = 1$$

X-int ($y=0$)

$$0 = \frac{x^2}{x^2-4}$$

$$0 = x^2$$

$$0 = x$$

$$(0, 0)$$

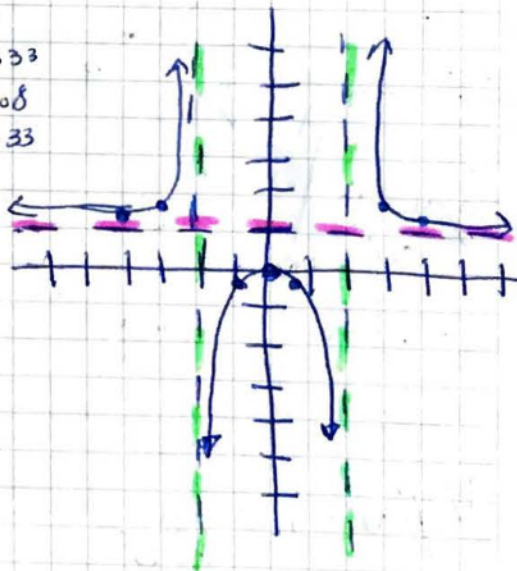
Y-int ($x=0$)

$$y = \frac{0}{0-4}$$

$$y = 0$$

$$(0, 0)$$

x	y
-4	$\frac{4}{3} \approx 1.33$
-3	$\frac{9}{5} = 1.8$
-1	$-\frac{1}{3} \approx -0.33$
0	0
1	$-\frac{1}{3}$
3	$\frac{9}{5} = 1.8$
4	$\frac{16}{3}$



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

Vertical asy

$$x^2 - 4 = 0$$

$$x = \pm 2$$

Horizontal Asy
(Deg num < Deg den)

$$y = 0$$

X-int ($y=0$)

$$0 = x$$

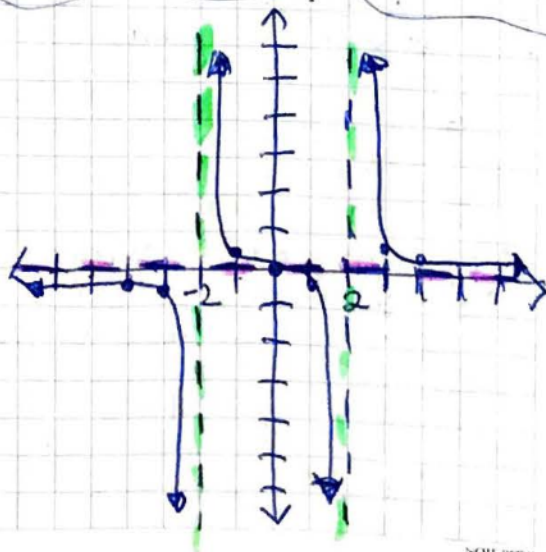
$$(0, 0)$$

Y-int ($x=0$)

$$y = \frac{0}{-4}$$

$$(0, 0)$$

x	y
-4	$-\frac{1}{3} \approx -0.33$
-3	$-\frac{3}{5} \approx -0.6$
-1	$\frac{1}{3} \approx 0.33$
0	0
1	$-\frac{1}{3} \approx -0.33$
3	$\frac{3}{5} \approx 0.6$
4	$\frac{1}{3} \approx 0.33$



#25) $g(x) = \frac{4(x+1)}{x(x-4)} = \frac{4x+4}{x^2-4x}$

Vertical asy.

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

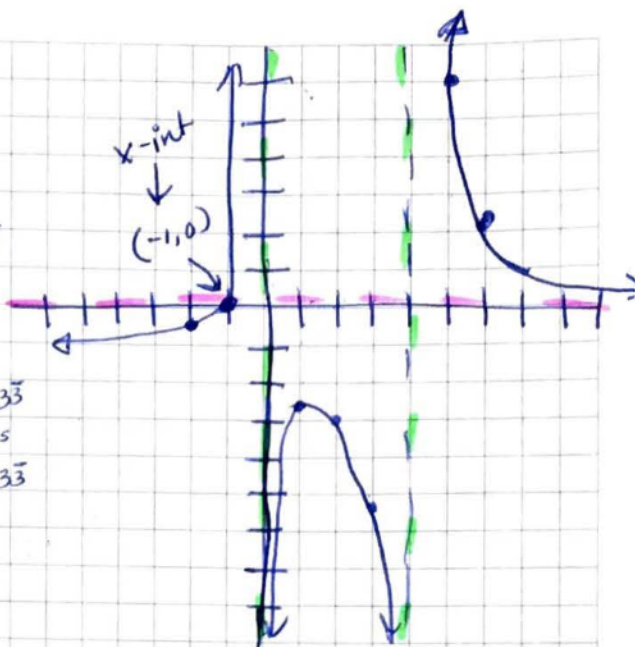
Horizontal asy
 (Deg num. < Deg. Den)

$y=0$

X-int ($y=0$)
 $0 = 4(x+1)$
 $0 = 4x+4$
 $-4 = 4x$
 $-1 = x$
 $(-1, 0)$

Y-int ($x=0$)
 $y = \frac{4}{0}$
 undefined

x	y
-2	$-\frac{1}{3} \approx -0.33$
-1	0
1	$-\frac{8}{3} \approx -2.66$
2	-3
3	$-\frac{11}{3} \approx -5.33$
5	$\frac{25}{4} \approx 6.25$
6	$\frac{7}{3} \approx 2.33$



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

Vertical Asy
 $0 = (x+1)(x-2)$
 $x = -1, x = 2$

Horizontal Asy
 (Deg num < Deg. den)

$y=0$

X-int ($y=0$)
 $0 = 3x$
 $0 = x$
 $(0, 0)$

Y-int ($x=0$)
 $y = \frac{0}{-2}$
 $y = 0$
 $(0, 0)$

x	y
-3	$-\frac{9}{10} \approx -0.9$
0	0
1	$-\frac{3}{2} = -1.5$
3	$\frac{9}{4} = 2.25$
4	$\frac{6}{5} = 1.2$

