

#W 20.3 p. 157-160
 #9-23 odd, 43-49 odd, 52, 72

SOLUTIONS

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

a) (VA)

$x+2=0$

$x = -2$

b) (HA) $n < m$

$y = 0$

c) y-intercepts

$f(0) = \frac{1}{0+2} = \frac{1}{2}$

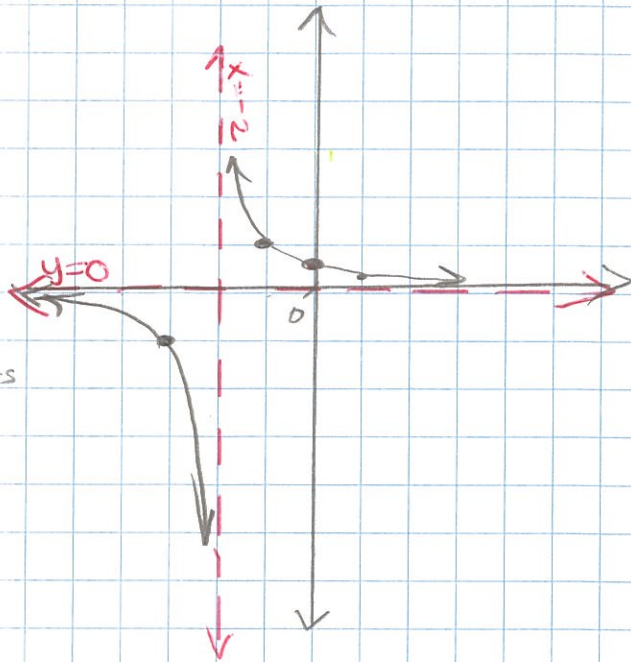
$(0, \frac{1}{2})$

d) x-intercepts

$1 \neq 0$
 NO

e) add. points

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



11) $g(x) = \frac{5+2x}{1+x}$

(VA) $1+x=0$

$x = -1$

(HA) $n = m$

$y = \frac{2}{1}$

y-inter.

$f(0) = \frac{5+2(0)}{1+0} = 5$

$(0, 5)$

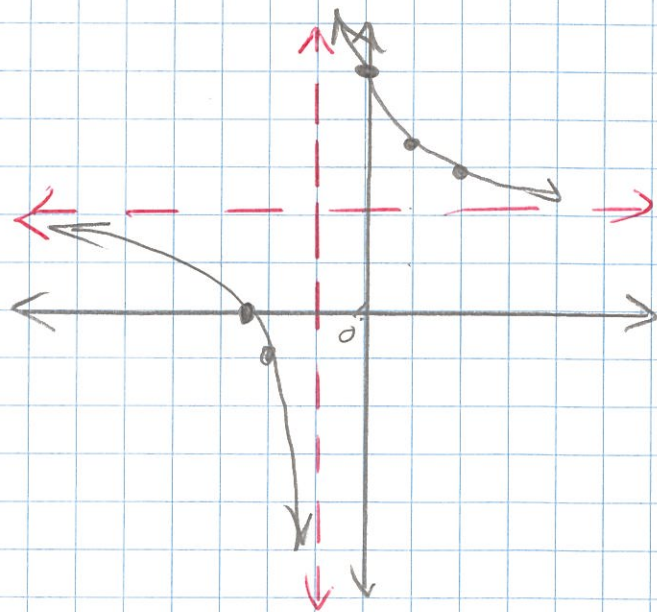
x-intercept

$5+2x=0$

$2x = -5$

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

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



Add. Points

x	f(x)
1	3,5
2	3
-2	-1

13.)

$$f(t) = \frac{1-2t}{t}$$

(VA) $t=0$

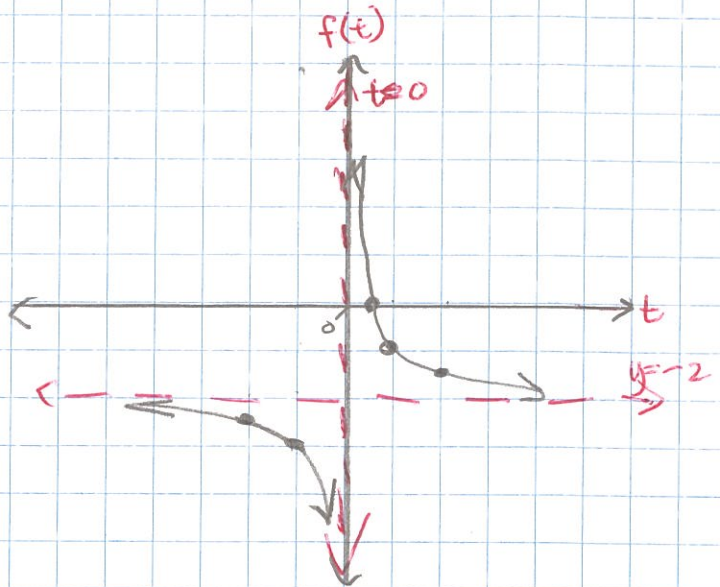
(HA) $n=m$

$$y = -\frac{2}{1}$$

y-intercept
 $f(0) = \frac{1-2(0)}{0}$
NONE

x-intercept.
 $1-2t=0$
 $-2t=-1$
 $t = \frac{1}{2}$

$$\left(\frac{1}{2}, 0\right)$$



Additional Points

t	f(t)
-1	-3
1	-1
-2	-2.5
2	-1.5

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

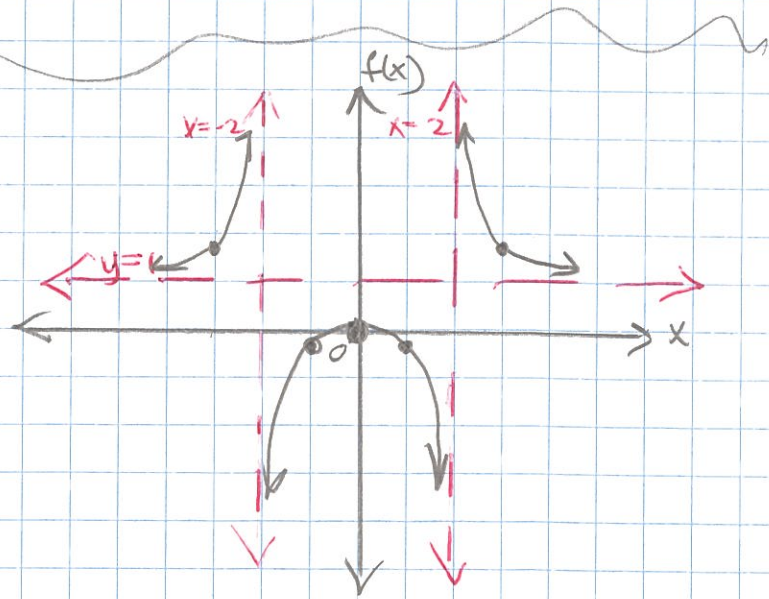
simplify
 $f(x) = \frac{x^2}{(x+2)(x-2)}$

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

(HA) $n=m$
 $y = \frac{1}{1}$

y-intercept
 $f(0) = \frac{0^2}{0^2-4} = 0$
 $(0, 0)$

x-intercept
 $x^2=0$
 $x=0$
 $(0, 0)$



additional Points

x	f(x)
-3	1.8
-1	-1.3
1	-1.3
3	1.8

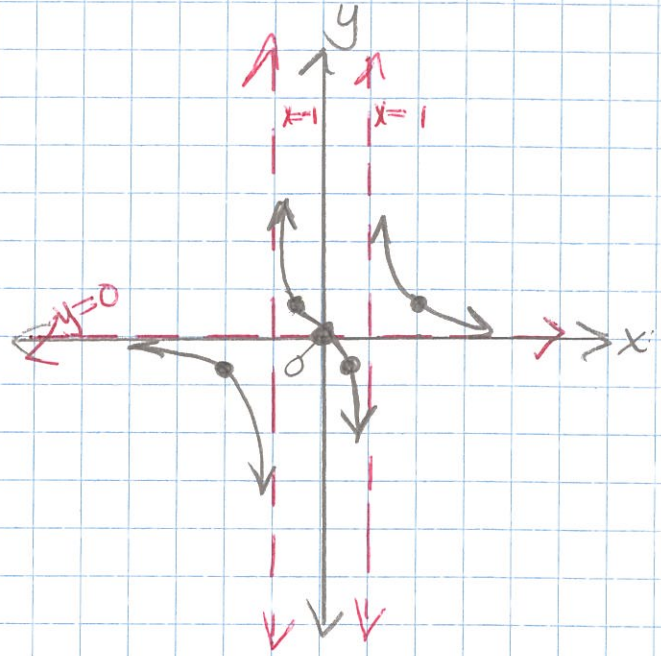
14) $f(x) = \frac{x}{x^2-1}$

simplify

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

VA) $x+1=0$ $x-1=0$
 $x=-1$ $x=1$

HA) $n < m$
 $y=0$



y-intercepts

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

$(0, 0)$

x-intercepts

$x=0$

$(0, 0)$

Additional Points

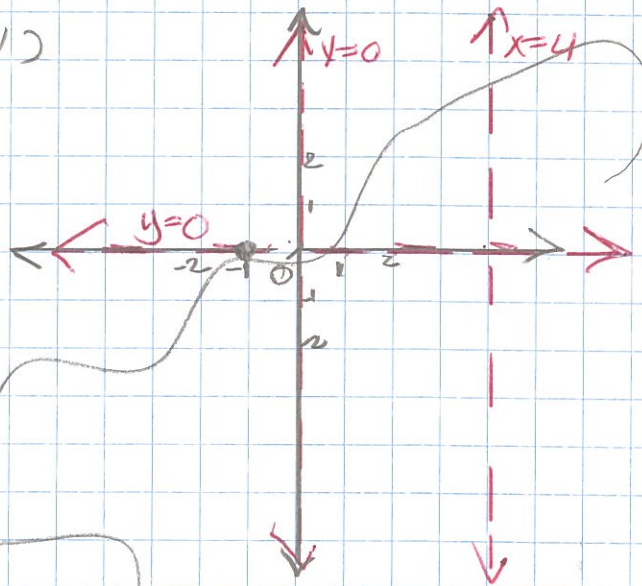
x	f(x)
1.5	-0.7
-1.5	0.7
2	0.7
-2	-0.7

19) $g(x) = \frac{4(x+1)}{x(x-4)}$

(This is a weird one!)

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

HA) $n=1, m=2$
 $n < m$
 $y=0$



y-intercept

$f(0) = \frac{4(0+1)}{0(0-4)} = \frac{4}{0}$
 NONE

x-intercept

$4(x+1)=0$
 $x+1=0$
 $x=-1$

$(-1, 0)$

Additional Points

x	f(x)
-0.5	
-2	
1	
3	
5	

Skip
 too weird!

21.) $f(x) = \frac{3x}{x^2 - x - 2}$

Simplify

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

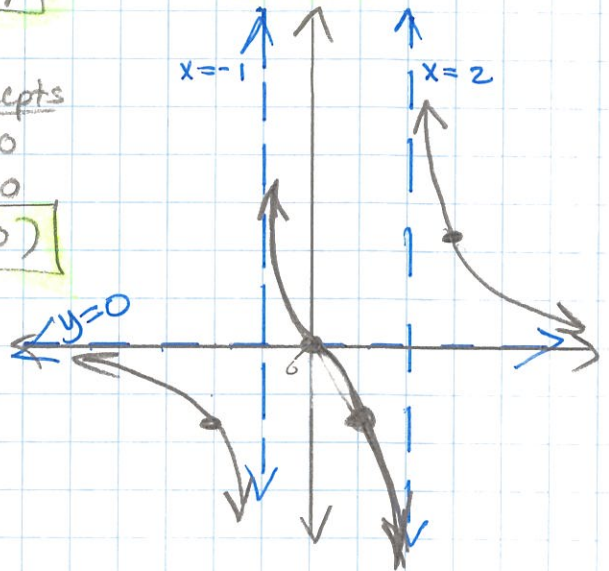
y-intercepts

$f(0) = \frac{3(0)}{0^2 - 0 - 2} = 0$
 $(0, 0)$

VA) $(x-2)(x+1) = 0$
 $x-2=0$ $x+1=0$
 $x=2$ $x=-1$

x-intercepts
 $3x = 0$
 $x = 0$
 $(0, 0)$

HA) $n=1, m=2$
 $n < m$
 $y=0$



add. points

x	f(x)
-2	-1,5
1	-1,5
3	2,25

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

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

VA) $x-2=0$
 $x=2$

HA) $n=m$
 $y = \frac{1}{1}$

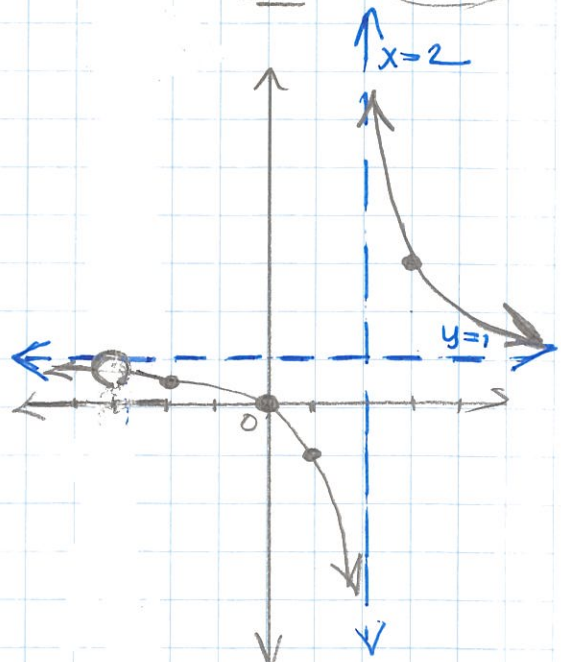
HOLE! $x = -3$

y-intercepts

$f(0) = \frac{0^2 + 3(0)}{0^2 + 0 - 6} = 0$
 $(0, 0)$

x-intercepts

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



Additional Points

x	f(x)
1	-1
3	3
-2	1,5

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

(VA) $x=0$

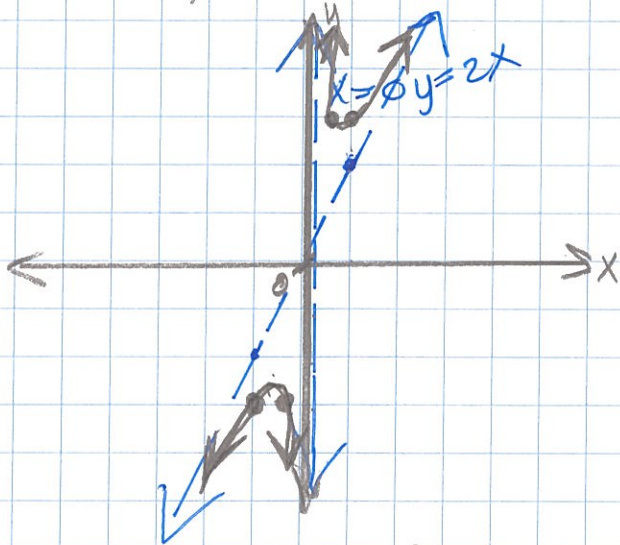
(HA) $n=2, m=1$
 $n > m$
NO HA

(SA) $x \sqrt{\frac{2x+0+\frac{1}{x}}{2x^2+0x+1}}$

$y=2x$ (SA)

~~y-intercept~~
 ~~$f(0) = \frac{2(0)^2 + 1}{0}$~~
~~0~~ **NONE**

~~x-intercept~~
 ~~$2x^2 + 1 = 0$~~
 ~~$2x^2 = -1$~~
 ~~$x^2 = -\frac{1}{2}$~~ **NONE**



Additional Points

x	f(x)
-1	-3
1	3
-0.5	-3
0.5	3

45. $h(x) = \frac{x^2}{x-1}$

(VA) $x-1=0$
 $x=1$

(HA) $n > m$
NO HA

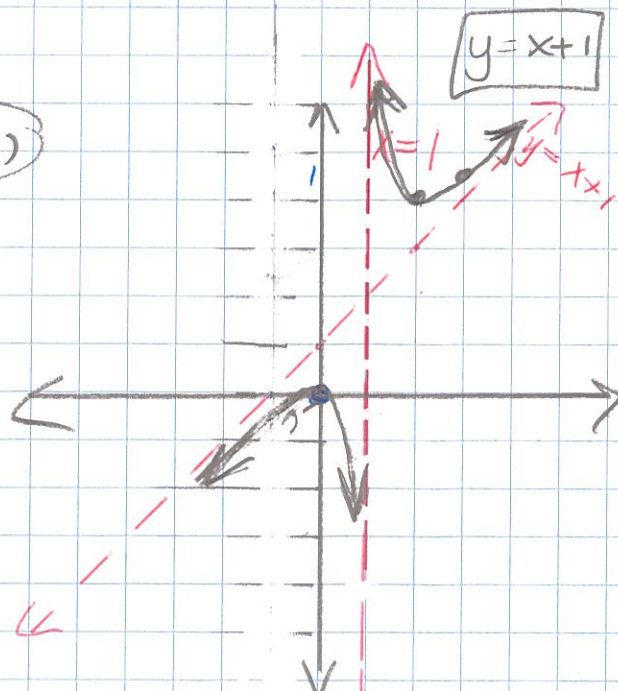
(SA) $x-1 \sqrt{\frac{x^2+0x+0}{x^2-0x-1}}$
 $-(x^2-x) \downarrow$
 $\frac{x+0}{-(x-1)}$
 $\frac{1}{1}$

y-intercept
 $f(0) = \frac{0^2}{0-1} = 0$
 $(0,0)$

x-intercept
 $x^2 = 0$
 $x = 0$
 $(0,0)$

Additional Points

x	f(x)
2	4
3	4.5



47.) $g(x) = \frac{x^3}{2x^2 - 8}$

VA) $2x^2 - 8 = 0$
 $2x^2 = 8$
 $x^2 = 4$
 $x = \pm 2$

HA) $n > m$
NO HA

5A) $2x^2 - 8 \overline{) x^3 + 0x^2 + 0x + 0}$
 $-(x^3 \quad -4x)$
 $0x^2 + 4x$

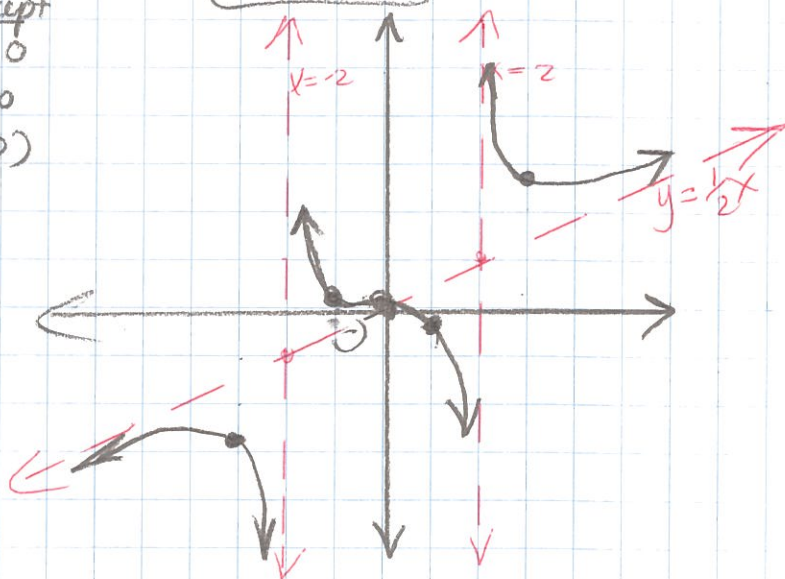
y-intercept
 $f(0) = \frac{0^3}{2(0)^2 - 8} = 0$
 $(0, 0)$

x-intercept
 $x^3 = 0$
 $x = 0$
 $(0, 0)$

Additional Points

x	f(x)
-3	-2.7
-1	.17
1	-.17
3	2.7

$y = \frac{1}{2}x$



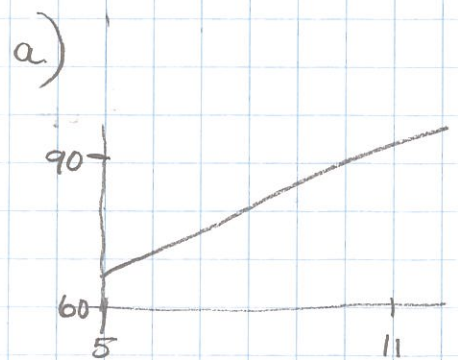
49. Another weird one!

SKIP # 49!

52.) x-intercept at about x=0

$0 = \frac{2x}{x-3}$
 $0 = 2x$
 $0 = x$ ✓

72.) $R = \frac{6.245t + 44.05}{0.025t + 1.00}$ $5 \leq t \leq 11$



b.) linReg
 $y = 3.6x + 49.34$
 $r^2 = .9939$
 $r = .9969$

c.) The model R seems to fit the data better than the linear regression model