HPC/RPC Review
Rational Functions

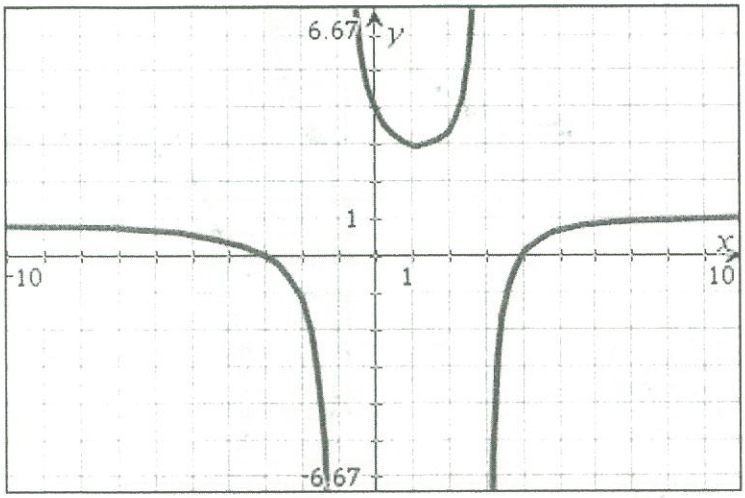
Name Key

Date _____ Period _____

PC Reporting Strand: Functions (Identify key features of graphs) Score _____

1. Given the graph of rational functions below, identify all key features of each.

a)



x-intercept(s): (-3,0), (4,0)

y-intercept: (0,4)

Vertical Asymptote(s): X=-1, X=3

End Behavior: Y=1
Asymptote

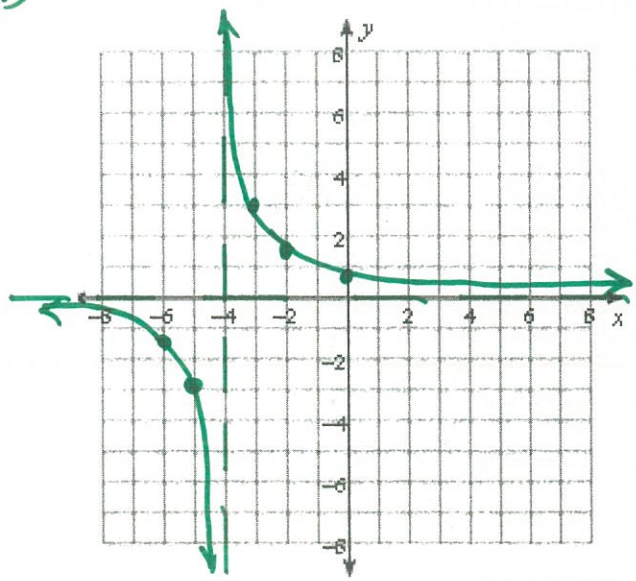
2. Given the equations below identify all key features of the rational function, then graph it.

a) $f(x) = \frac{3}{x+4}$

x-intercept(s) NONE y-intercept (0, 3/4) Holes NONE

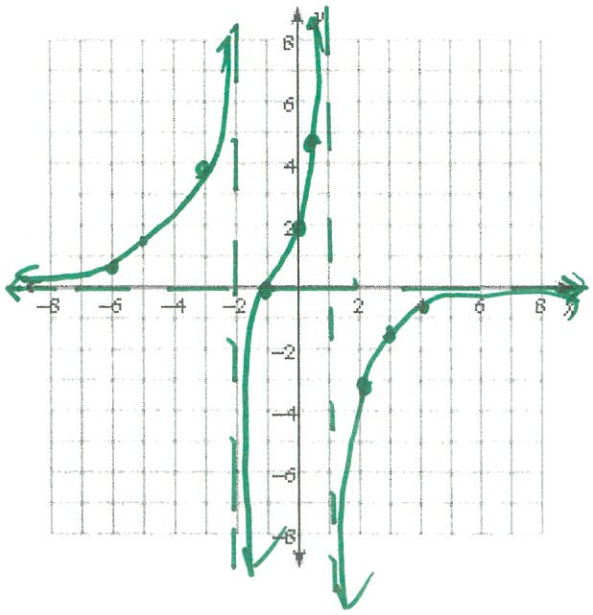
Vertical Asymptote(s) X=-4

End Behavior Y=0



b) $f(x) = \frac{-4x-4}{x^2+x-2}$ = $\frac{-4(x+1)}{(x+2)(x-1)}$

x-intercept(s) (-1, 0) y-intercept (0, 2) Holes NONE



Vertical Asymptote(s) $x = -2, 1$

End Behavior $y = 0$

$n = 1$ $m = 2$ $n < m$

x	f(x)
-5	8/9
-4	1.2
-3	4

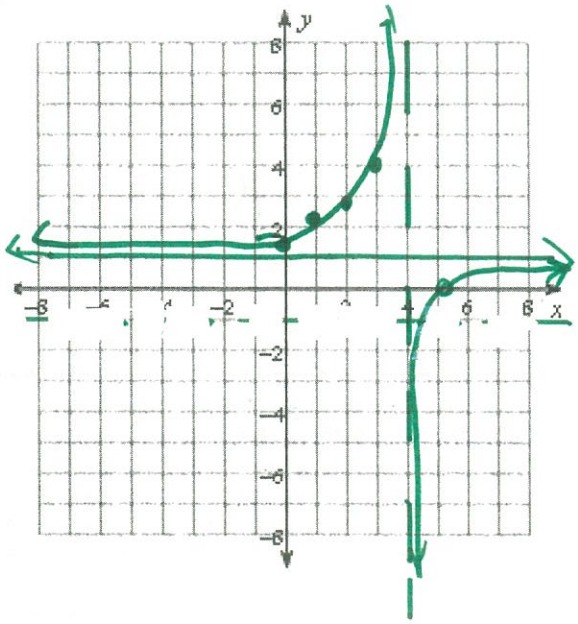
x	f(x)
-1	0
0	2
1/2	4.8

x	f(x)
2	-3
3	-1.6
4	DNE

c) $f(x) = -\frac{1}{x-4} + 1$ = $\frac{-1}{(x-4)} + \frac{1(x-4)}{1(x-4)}$ = $\frac{-1+x-4}{x-4}$ = $\frac{x-5}{x-4}$

NONE

x-intercept(s) (5, 0) y-intercept 1.25 Holes

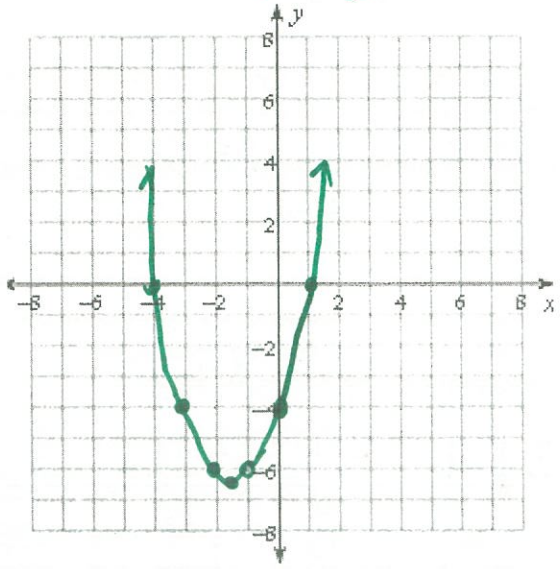


Vertical Asymptote(s) $x = 4$

End Behavior $y = 1$

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

x-intercept(s) (1,0) (-4,0) y-intercept (0,4) Holes (-1, -6)

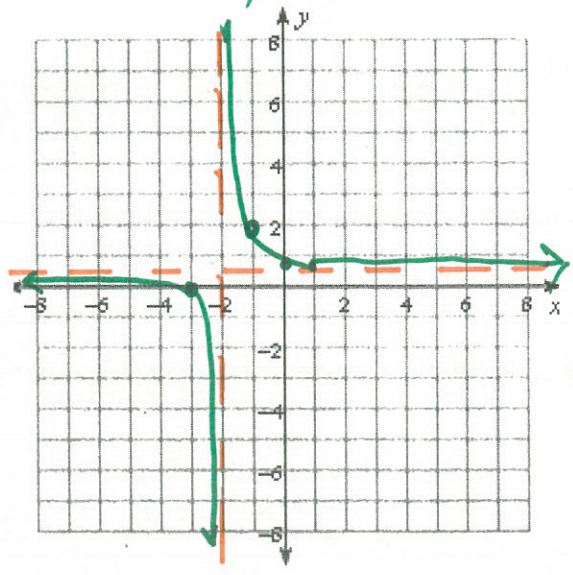


Vertical Asymptote(s) NONE

End Behavior $y = x^2 + 3x - 4$

e) $f(x) = \frac{x^2-9}{2x^2-2x-12} = \frac{(x-3)(x+3)}{2(x-3)(x+2)}$

x-intercept(s) (-3,0) y-intercept (0, 3/4) Holes (3, 0.6)

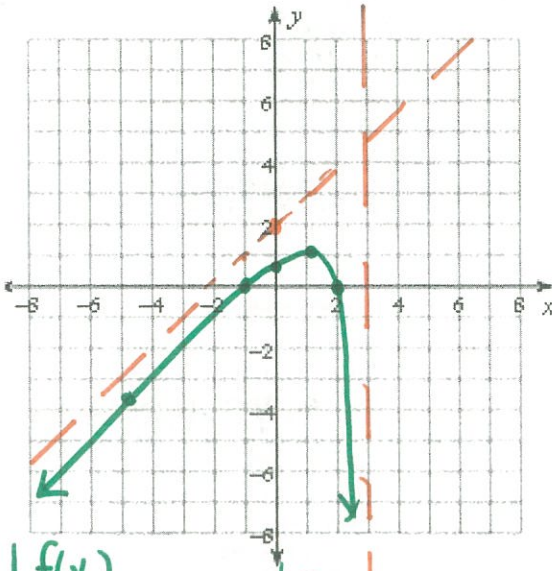


Vertical Asymptote(s) $x = -2$

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

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

x-intercept(s) $(2,0)$ $(-1,0)$ y-intercept $(0, \frac{2}{3})$ Holes NONE



Vertical Asymptote(s) $x=3$

End Behavior $y = x+2$

3	1	-1	-2
	0	3	6
	1	2	4

x	f(x)
-5	-35
-2	0.8
-1	0
-0	$\frac{2}{3}$
1	0
2	0

x	f(x)
4	10
5	9
7	10

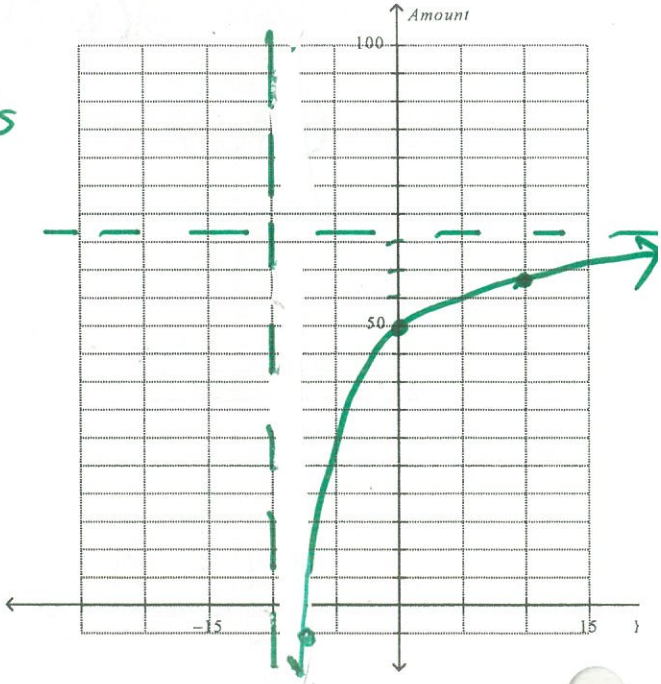
NOT VISIBLE ON GRAPH

5. The number of squirrels at any time t (in years) in a rural area is given by: $P(t) = \frac{750+100t}{15+1.5t}$

a) Find the population of squirrels when the value of t is:

t(10)
$P(10) = \frac{750+100(10)}{15+(.5(10)} = \frac{1750}{30} \approx 58$ squirrels

t(50) $= \frac{750+100(50)}{15+1.5(50)} = \frac{5750}{90} \approx 63$



b) Find the t-intercept **AND** y-intercept?

$t = -7.5$ $y = 50$

What is the significance of each number?

y-int beginning population

c) Use the given coordinate system to sketch the function. (Find asymptotes before you graph)

EBA
n=1 m=1 $y = \frac{100}{15} \approx 66.6$

X-int $x = -16$