Agenda:

Lecture: Rational Functions

Examples: Rational Functions

Review: Week 3

Groupwork- Poly End Behaviour

Lecture Rational Functions

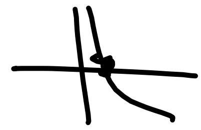
Precalculus = study of Functions

Functions

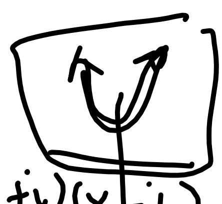
Data, Graphs, Equations, Words

Polynomials Degree, Lead, Zeros

Fundamental Theorem $\Rightarrow$ Degree = Linear Factors
Zeros
Roots

X intercept 

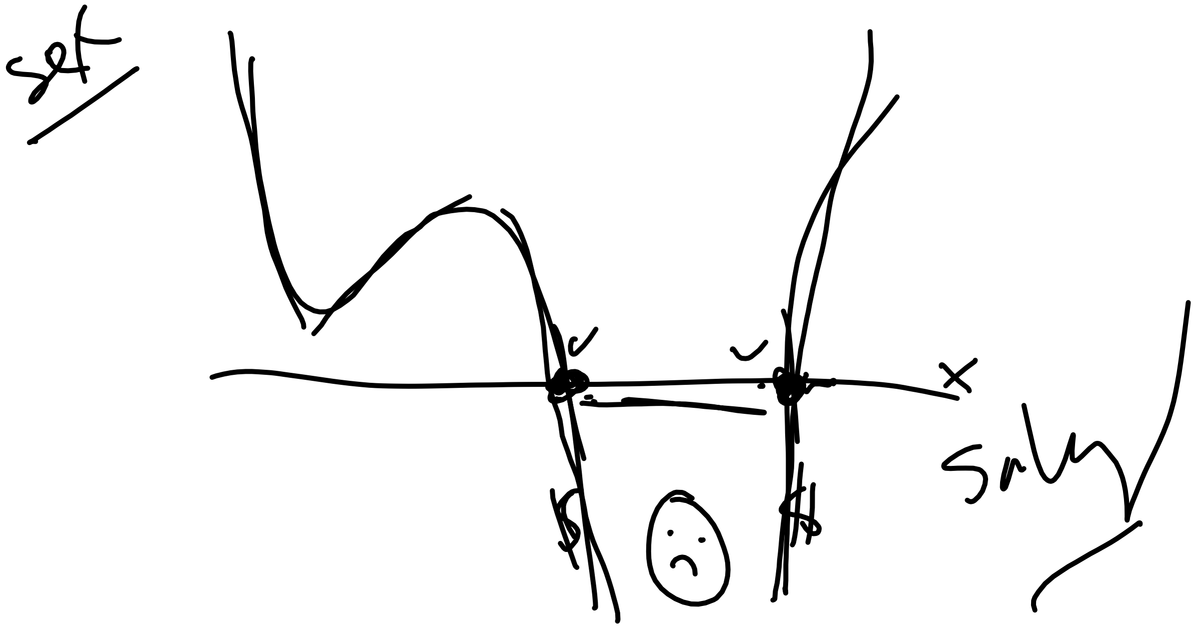
zero : a $f(a) = 0$



$f(x) = x^2 + 1 = (x+i)(x-i)$

1 $f(i) = i^2 + 1 = -1 + 1 = 0$

2 $f(-i) = (-i)^2 + 1 = -1 + 1 = 0$


x

Rational Functions

$$\boxed{r(x) = \frac{p(x)}{q(x)}}$$

$p(x)$ ⟵ Numerator

$q(x)$ ⟵ Denominator

Degree of Numerator (DN)

" " Denominator (DD)

Lead of Numerator (LN)

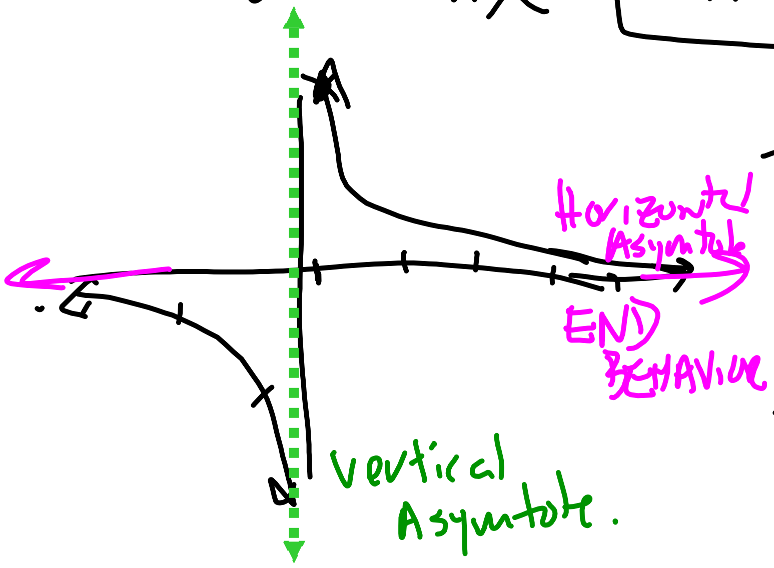
" " Denom (LD)

Zeros of Numerator (ZN)

" " Denom. (ZD)

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

DN: 0 LN: 1 ZN: -
DD: 1 LD: 1 ZD: 0

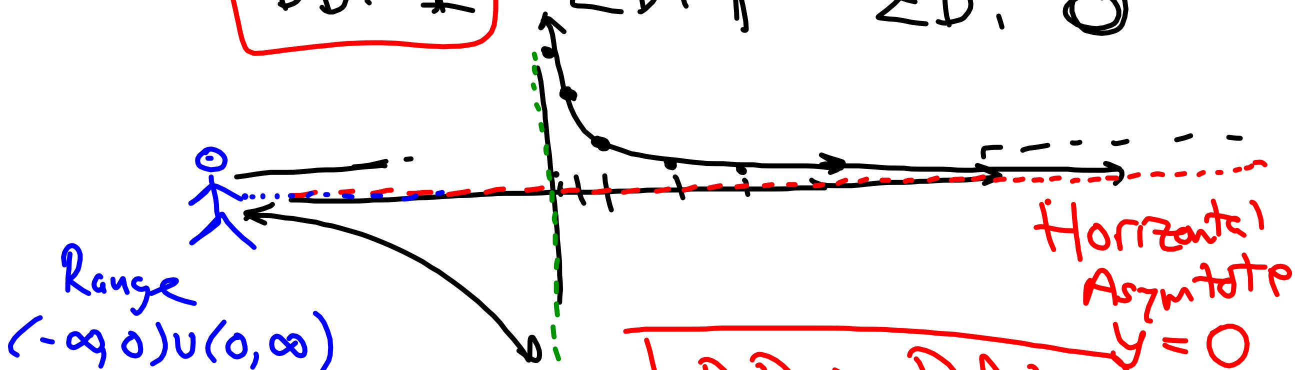


x	y
1	1
10	$1/10$
1000	$1/1000$
-1	-1
-100	$-1/100$
$1/100$	100

Ex $y = \frac{1}{x^1} = x^{-1}$ $x^0 = 1$

DN: 0 LN: 1 ZN: —

DD: 1 LD: 1 ZD: 0



Vertical Asymptote

ZD ✓

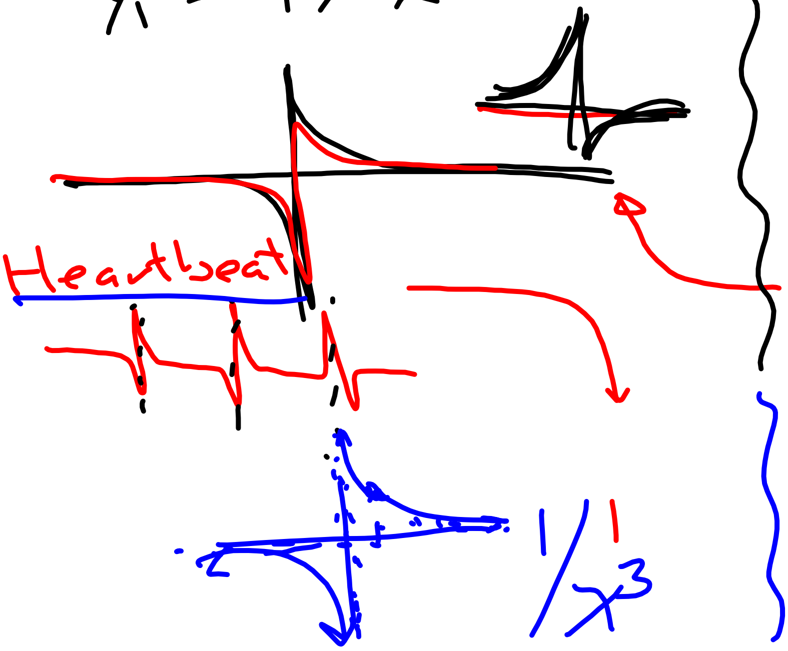
$DD > DN$

HA: $y = 0$

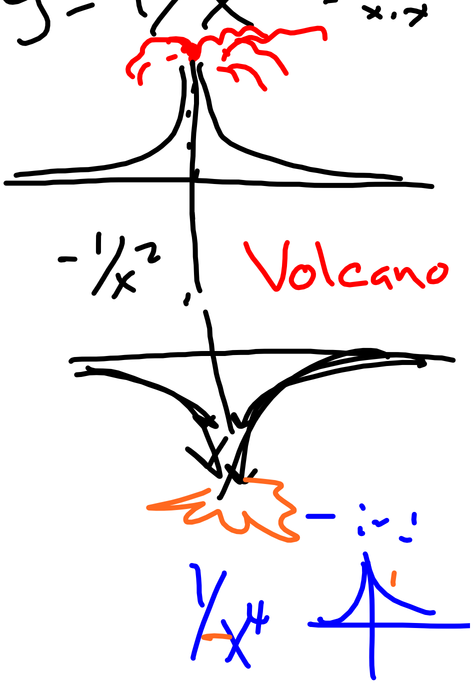
Zeros ✓

ZN (None)

$y_1 = 1/x$



$y = 1/x^2 = \frac{1}{x \cdot x}$



Ex

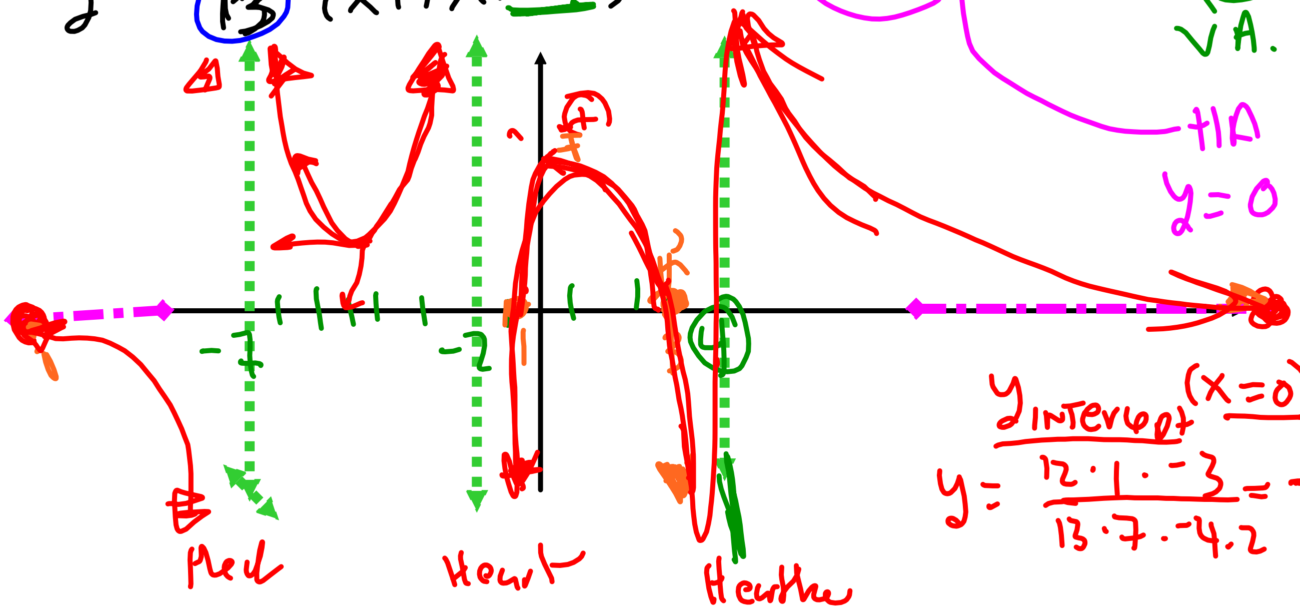
$$y = \frac{12(x+1)(x-3)}{13(x+7)(x-4)(x+2)}$$

DN: 2
DD: 3

LN: 12
LD: 13

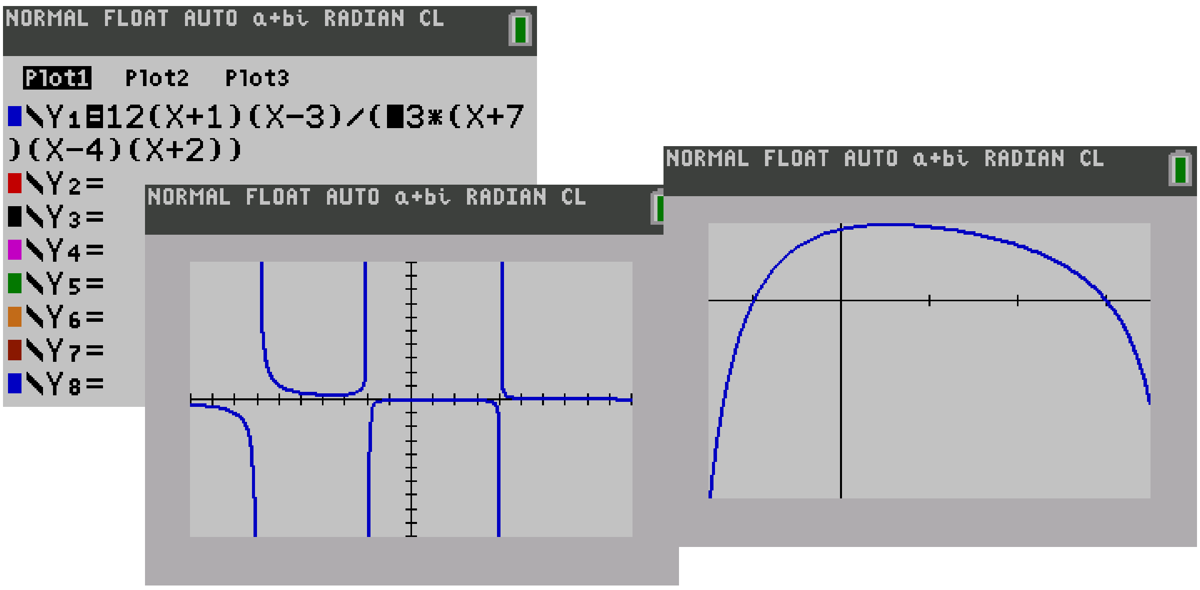
ZN: -1, 3
ZD: -7, 4, -2
V.A.

HA
$y = 0$



y intercept (x = 0)

$$y = \frac{12 \cdot 1 \cdot {}^-3}{13 \cdot 7 \cdot {}^-4 \cdot 2} = +$$

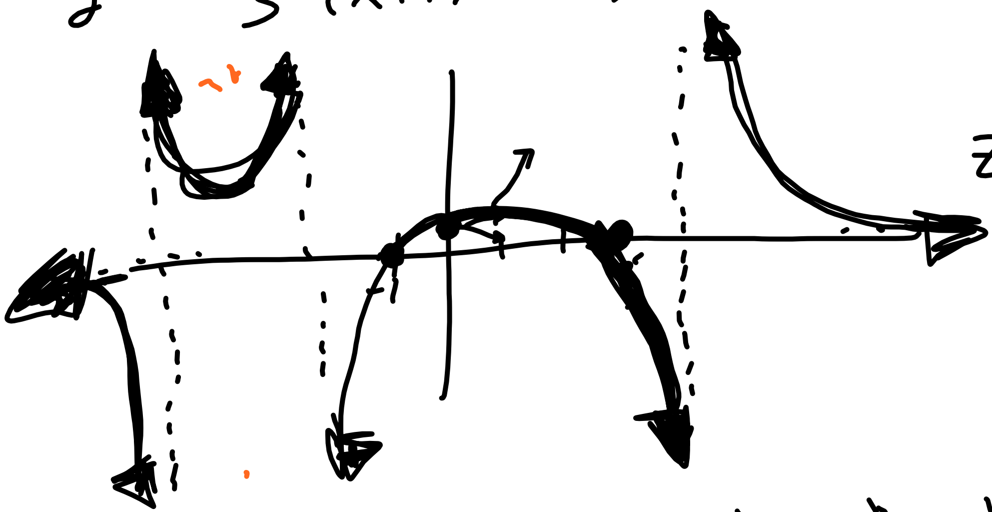


$$y = \frac{2}{3}\,\frac{(x+1)(x-3)}{(x+7)(x-4)(x+2)}$$

$\frac{DN=2}{DD=3}$ DD>DN

HA: $y=0$

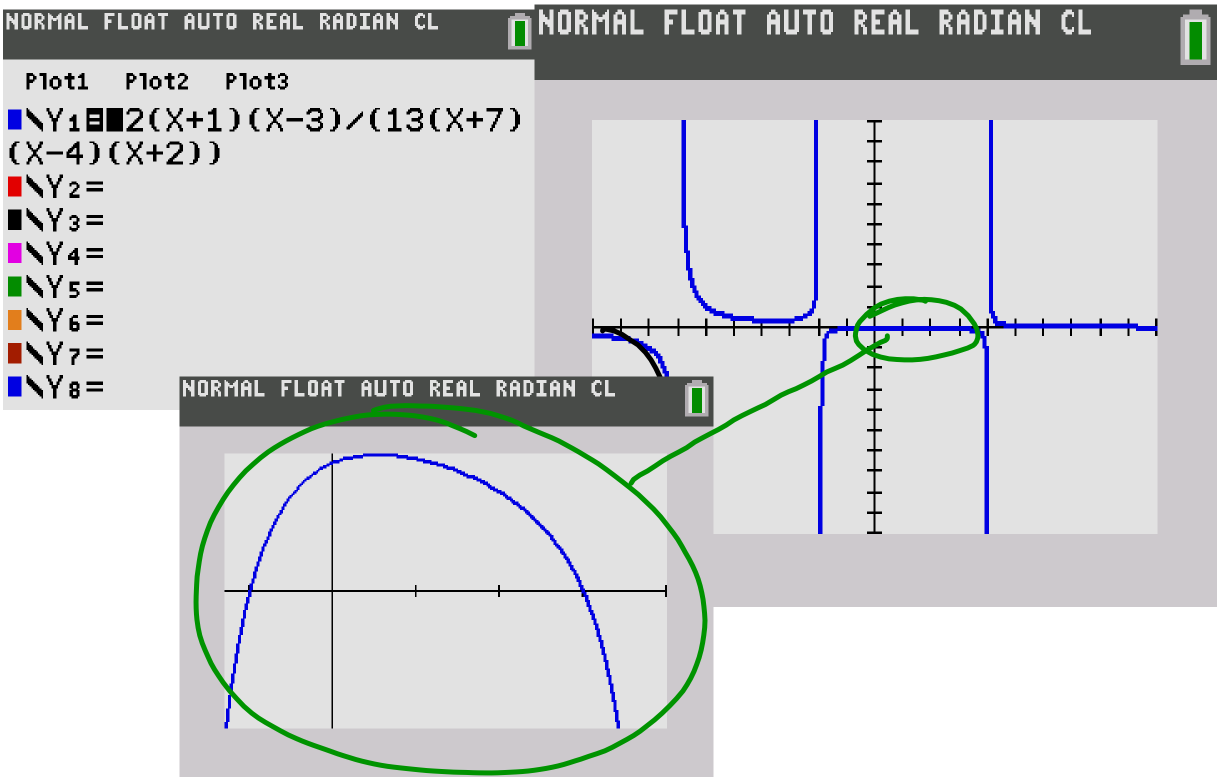
Zeros:
ZN: $-1, 3$



Vert. Asy.
ZD:
$-7, 4, -2$

$\frac{2}{3}\cdot\frac{1\cdot -3}{7\cdot -4\cdot 2}$

Y INT $(x=0)$
$1/28$


NORMAL FLOAT AUTO REAL RADIAN CL
Plot1 Plot2 Plot3
Y1=2(X+1)(X−3)/(13(X+7)(X−4)(X+2))
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
Y8=
NORMAL FLOAT AUTO REAL RADIAN CL
NORMAL FLOAT AUTO REAL RADIAN CL

$$y=\boxed{\frac{2(x-1)^{2}(x+4)^{3}}{3(x-5)^{6}(x+2)^{3}}}$$

DN: 5

DD: 9

DD > DN

HA: $y=0$

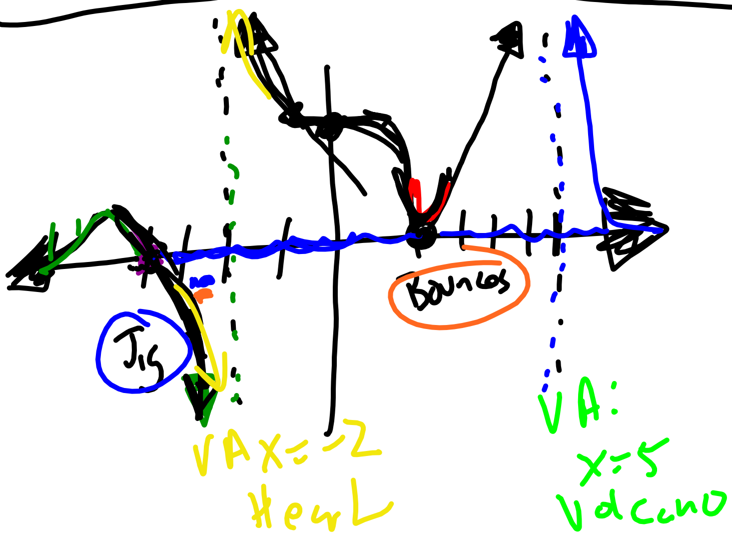
Zeros: 1 (Bounce), −4 (Pass)

ZN

V.A: $x=5$ (Volcano), −2 (Heart)

ZD

Y_{int} $(x=0)$ ⊕



$$y = \frac{2(x-1)^2(x+4)^3}{3(x-5)^6(x+2)^3}$$

Y INT (x=0)

Bounces jig

DN: 5

DD: 9

LN: 2

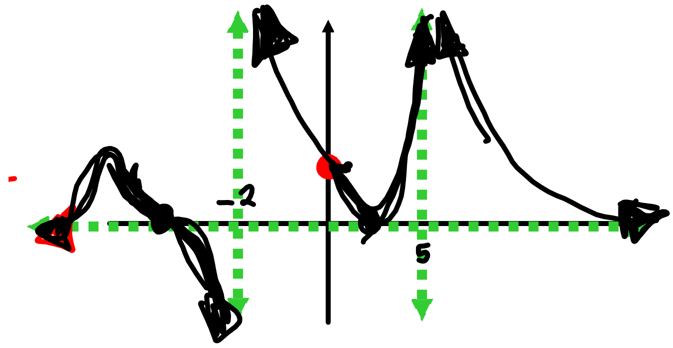
LD: 3

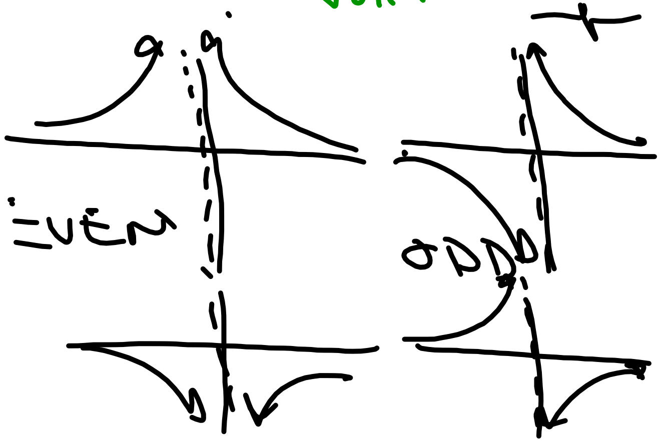
ZN: 1, 1, −4, −4, −4

ZD: 5 5 5 5 5 5 −2 −2 −2

Volcano Heart

$\boxed{\text{HA: } y=0}$





Qualitative

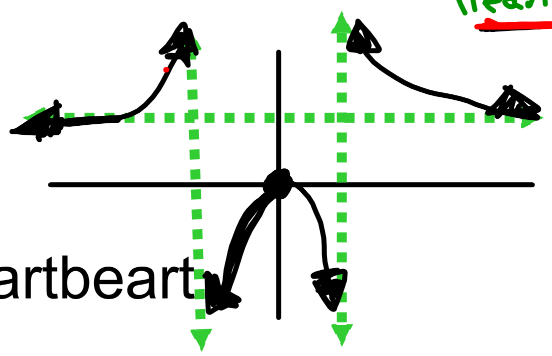
(Not to scale)

What if DN = DD ? $\boxed{HA: \; y = \frac{LN}{LD}}$

Ex $y = \frac{3x^2}{x^2-1}$ DN: 2 LN: 3 ZN: 0,0

$(x+1)^1(x-1)^1$ DD: 2 LD: 1 ZD: 1, -1

Heart



start at y=3

cant go down no xint

vertical asymp is heartbeart

zero (bounce)

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

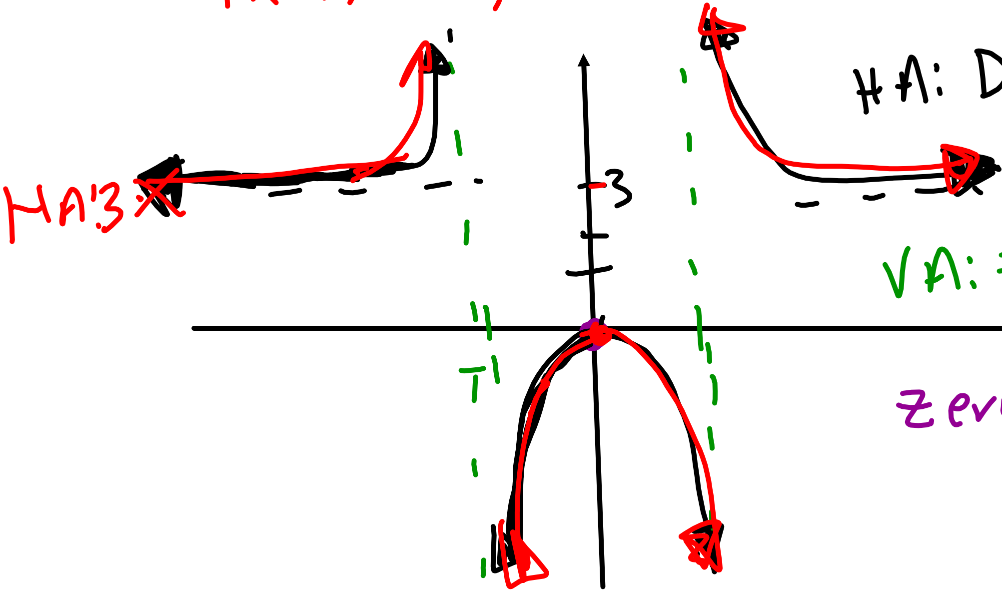
heartbeat

horizontal asymptote

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

DN = 2 LN = 3 ZN: 0, 0

DD = 2 LD = 1 ZD: 1, −1



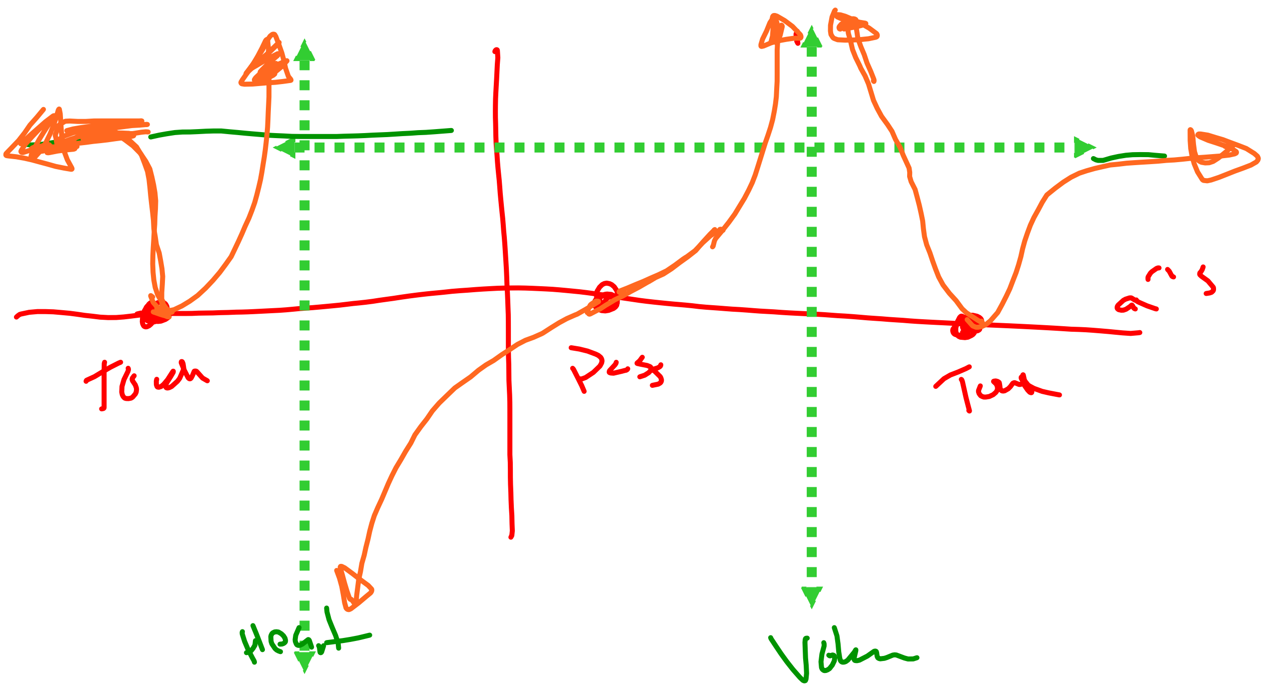
HA: DN = DD

$y = \frac{LN}{LD} = \frac{3}{1}$

VA: ZD 1, −1

Zeros: ZN 0

touch



$(4x-3)^2$ $(4x-3)(4x-3)$

$16x^2 - \underbrace{12x - 12x} + 9$

$16x^2 - \underbrace{24x} + 9$

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

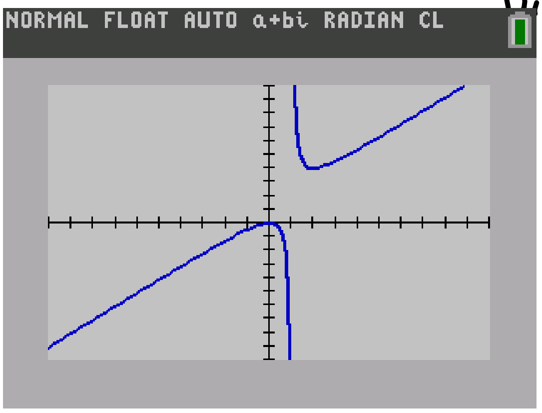
DN: 2

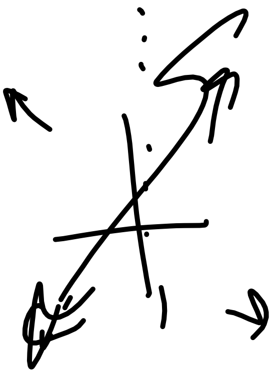
DD: 1

DN > DD

Happy/Sad

Discos

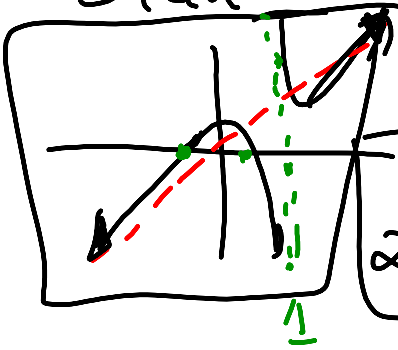




What if DN > DD

Discos't Happy/Sad

or ~~Slant Asymptotes~~



DN − DD

EVEN ✓
Happy/Sad
LC/LD = +, −

ODD
Disco slant
LC/LD = + −
Right, Left

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

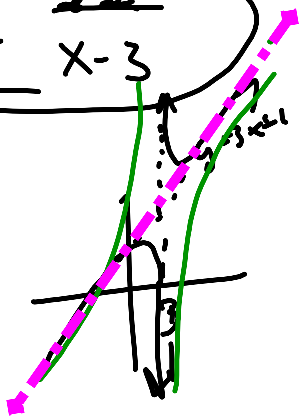
$$\frac{x^2-.1}{2(x-1)} = \frac{x^2-1\ldots}{2x-2}$$

$$y = \frac{1}{2}x + \frac{1}{2} + \frac{.9}{2x-2}$$

$$
\begin{array}{r|l}
2x-2 & x^2 + 0x - .1 \\
 & -(x^2 - x) \\
\hline
 & x \\
 & -(x - 1) \\
\hline
 & .9
\end{array}
$$

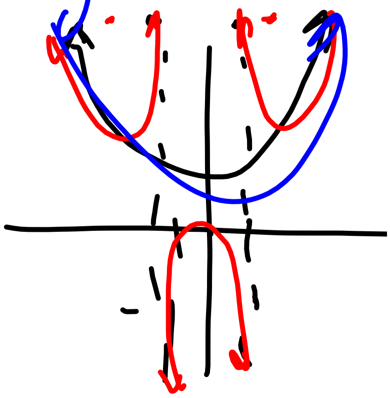
Ex $y = \dfrac{3x^2 - 2x + 1}{x - 3} = \underset{3}{\overset{\text{Sm 12}}{3x}} + 7 + \underset{3.01}{\overset{\text{Big.}}{\dfrac{22}{x-3}}}$

$$
\begin{array}{r l}
 & 3x + 7 + \dfrac{22}{x-3} \\
x - 3 \,\big) & 3x^2 - 2x + 1 \\
 & -(3x^2 - 9x) \\
 & \qquad 7x \\
 & \quad -(7x - 21)
\end{array}
$$

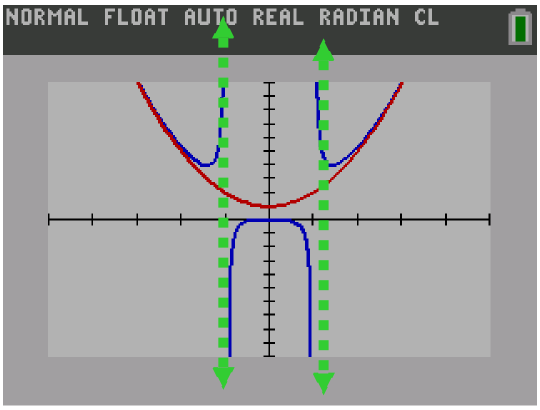


$$y = \frac{x^4}{x^2-1}$$

Slant Asymptote



$$\begin{array}{r|l} & 1x^2 + 1 \\ \hline x^2-1 & x^4 \\ & -(x^4 - x^2) \\ \hline & x^2 \end{array}$$

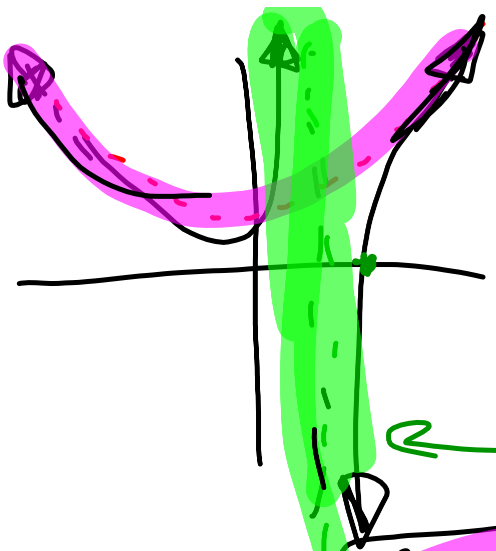


VA:

Slant Asymp

$$\boxed{\frac{1x^2 - .1}{2x^1 - 2}} = \boxed{\frac{1}{2}x^1 + \frac{1}{2}} + \frac{.9}{2x-2}$$

$$\boxed{\frac{5}{3}} = \boxed{1\ \frac{2}{3}}$$



Slant Asymptote

vertical

DN: 3

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

DD: 1

$$x^2-2x-1+\frac{4}{\cancel{x-1}}$$

$$x-1 \overline{\big)\, x^3-3x^2+x-3}$$

$$-\left(x^3-x^2\right)$$

$$-2x^2+x$$

$$-\left(-2x^2+2x\right)$$

$$-x-3$$

$$-\left(-x+1\right)$$

$$-4$$

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

DD > DN $\left(\frac{1}{x^2}\right)$ HA: $y=0$

DD = DN $\left(\frac{2x^2}{x^2+1}\right)$ HA: $y=\frac{LN}{LD}$

DD < DN $\left(\frac{x^2}{x+1}\right)$ Slant Asymptote

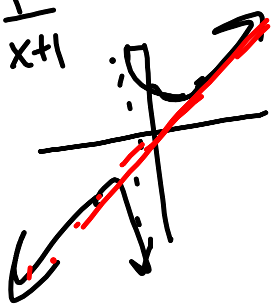
DN − DD = 2 − 1 = 1 odd

Disco.

$\frac{LN}{LD}$ = + Right

$$x - 1 + \frac{1}{x+1}$$

$$\begin{array}{r|l} x+1 & x^2+0x+0 \\ & -(x^2+x) \\ \hline & -x \\ & -(-x-1) \\ \hline & 1 \end{array}$$

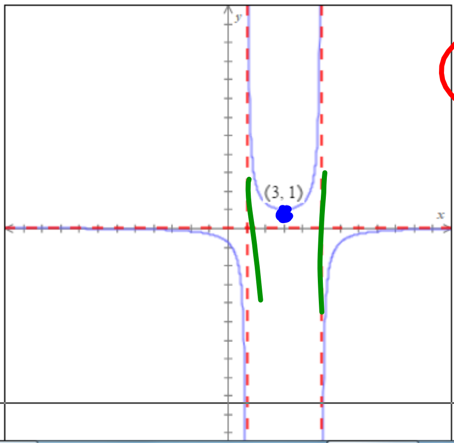


$y = x - 1$

Examples Rational Functions

The figure below shows the graph of a rational function f.
It has vertical asymptotes $x = 1$ and $x = 5$, and horizontal asymptote $y = 0$.
The graph does not have an x-intercept, and it passes through the point $(3, 1)$.

The equation for $f(x)$ has one of the five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
You can assume that $f(x)$ is in simplest form.



- $f(x) = \cancel{\dfrac{a}{x-b}}$
- $f(x) = \cancel{\dfrac{a(x-b)}{x-c}}$
- $f(x) = \dfrac{a}{(x-1)(x-5)}$
- $f(x) = \cancel{\dfrac{a(x-b)}{(x-c)(x-d)}}$
- $f(x) = \cancel{\dfrac{a(x-b)(x-c)}{(x-d)(x-e)}}$

NO X INT.

ZN: NONE

VERT ASYMP
$X = 1, 5$

ZD: 1, 5

Factors
$(X-1)(X-5)$

$$y = \frac{a}{(x-1)(x-5)} \leftarrow (3, 1)$$

$$1 = \frac{a}{(3-1)(3-5)} \quad 2 \cdot (-2)$$

$$-4 = a$$

Talking:

The figure below shows the graph of a rational function f.
It has vertical asymptotes $x = 1$ and $x = \cancel{5}\ 4$, and horizontal asymptote $y = 0$.
The graph does not have an x-intercept, and it passes through the point $(3, 1)$.

~~The equation for $f(x)$ has one of th~~e five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
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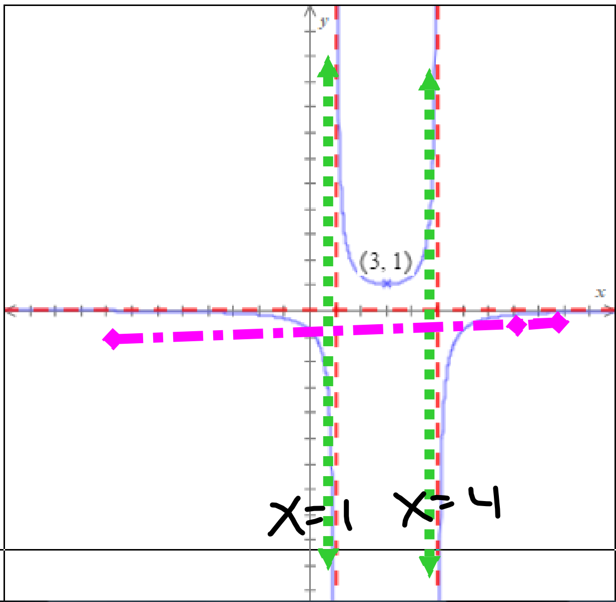


- $f(x) = \dfrac{a}{x-b}$
- $f(x) = \dfrac{a(x-b)}{x-c}$
- ✓ $f(x) = \dfrac{a}{(x-b)(x-c)}$
- $f(x) = \dfrac{x-b}{(x-c)(x-d)}$
- $f(x) = \dfrac{a(x-b)(x-c)}{(x-d)(x-e)}$

$(3,1)$

$y = \dfrac{a}{(x-1)(x-4)}$

$1 = \dfrac{a}{(3-1)(3-4)}$

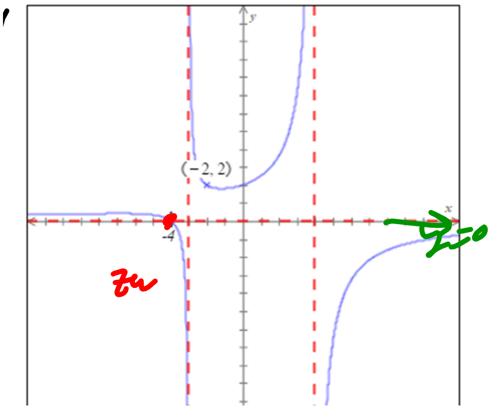
$1 = \dfrac{a}{-2}$

$a = -2$

$y = \dfrac{-2}{(x-1)(x-4)}$

graph has x-intercept -4, and it passes through the point $(-2, 2)$.

equation for $f(x)$ has one of the five forms shown below.
ose the appropriate form for $f(x)$, and then write the equation.
can assume that $f(x)$ is in simplest form.



4 VA

- $f(x) = \cancel{\dfrac{a}{x-b}}$
- $f(x) = \cancel{\dfrac{a(x-b)}{x-c}}$
- $f(x) = \cancel{\dfrac{a}{(x-b)(x-c)}}$
- $f(x) = \dfrac{a(x-b)}{(x-c)(x-d)}$
- $f(x) = \cancel{\dfrac{a(x-b)(x-c)}{(x-d)(x-e)}}$

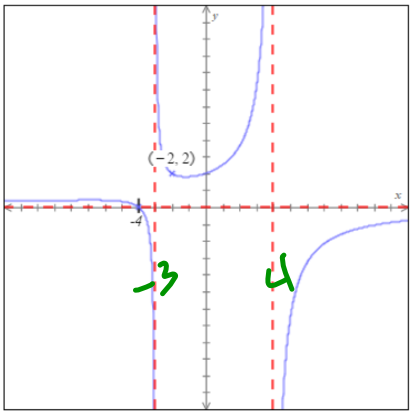
$$y = \frac{a(x+4)}{(x+3)(x-4)}$$

$$y(2) = \frac{a(-2+4)}{(-2+3)(-2-4)}$$

The graph has x-intercept -4, and it passes through the point $(-2, 2)$.

Talking:

The equation for $f(x)$ has one of the five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
You can assume that $f(x)$ is in simplest form.



- $f(x) = \cancel{\dfrac{a}{x-b}}$
- $f(x) = \dfrac{a(x-b)}{x-c}$
- $f(x) = \cancel{\dfrac{a}{(x-b)(x-c)}}$
- ✓ $f(x) = \dfrac{a(x-b)}{(x-c)(x-d)}$
- $f(x) = \cancel{\dfrac{a(x-b)(x-c)}{(x-d)(x-e)}}$

ZN: -4
Factor $(x+4)$

ZD: $-3, 4$
Factor $(x+3)(x-4)$

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

$$2 = \frac{a(-2+4)}{(-2+3)(-2-4)}$$

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9/21/201

The graph has x-intercept -4, and it passes through the point $(-2, 2)$.

Talking:

The equation for $f(x)$ has one of the five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
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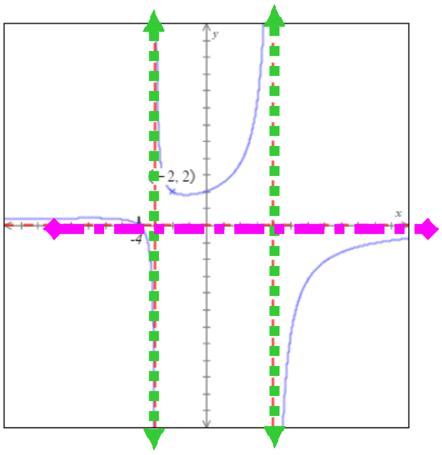

- $f(x) = \cancel{\dfrac{a}{x-b}}$
- $f(x) = \cancel{\dfrac{a(x-b)}{x-c}}$
- $f(x) = \dfrac{a}{(x-b)(x-c)}$
- ✓ $f(x) = \dfrac{a(x-b)}{(x-c)(x-d)}$
- $f(x) = \cancel{\dfrac{a(x-b)(x-c)}{(x-d)(x-e)}}$

Point $(-2,2)$

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

$$2 = \frac{a(-2+4)}{(-2+3)(-2-4)}$$

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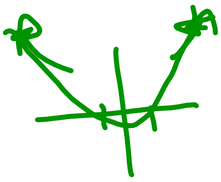
Remember...

$$\frac{35}{6}$$

$$6 \overline{)35}$$

$$y = \frac{x^4 - 1}{x^2 + 4}$$



Slant Asy

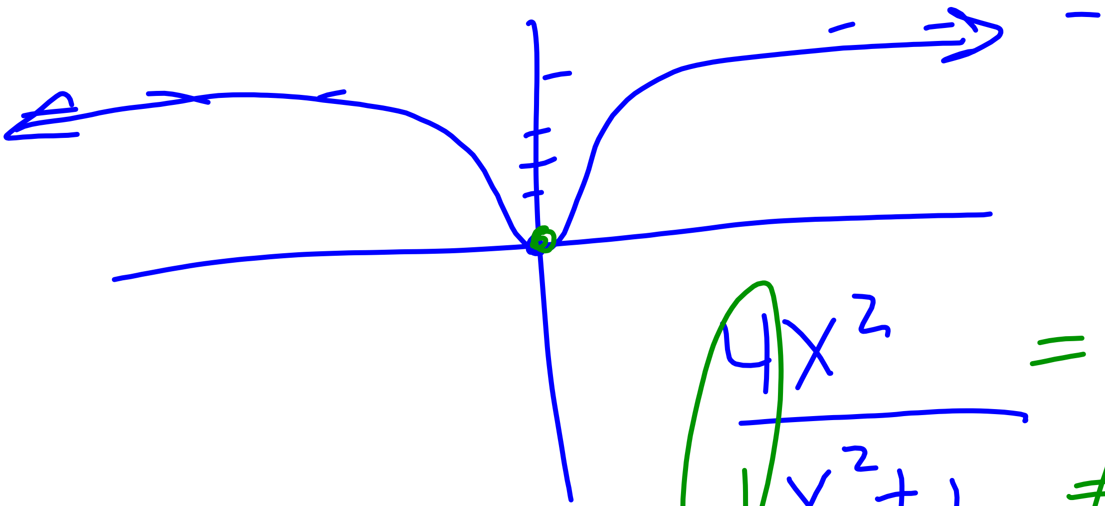
$$x^2 + 0x + 4 \overline{) x^4 + 0 + 0 + 0 + -1}$$

ZN: $(x^4 - 1) = (x^2 - 1)(x^2 + 1)$

$(x-1)(x+1)(x+i)(x-i)$

ZD: $x^2 = -4$ $\quad x = \pm\sqrt{-4}$

$= \pm 2i$

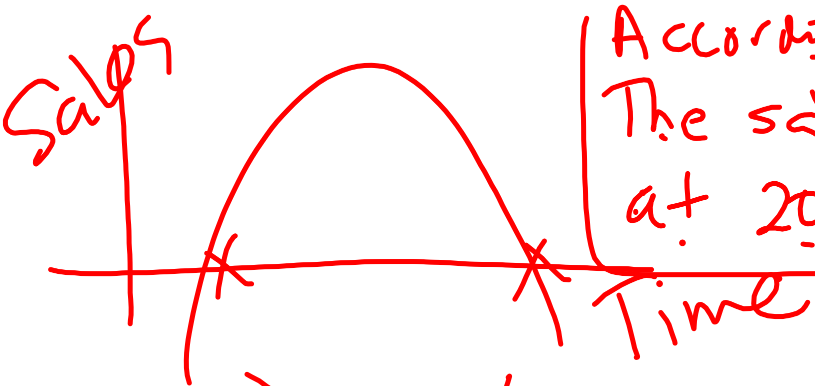


$$\frac{4x^2}{1x^2+1} \quad \begin{matrix} = 0 \\ \neq 0 \end{matrix}$$

Groupwork

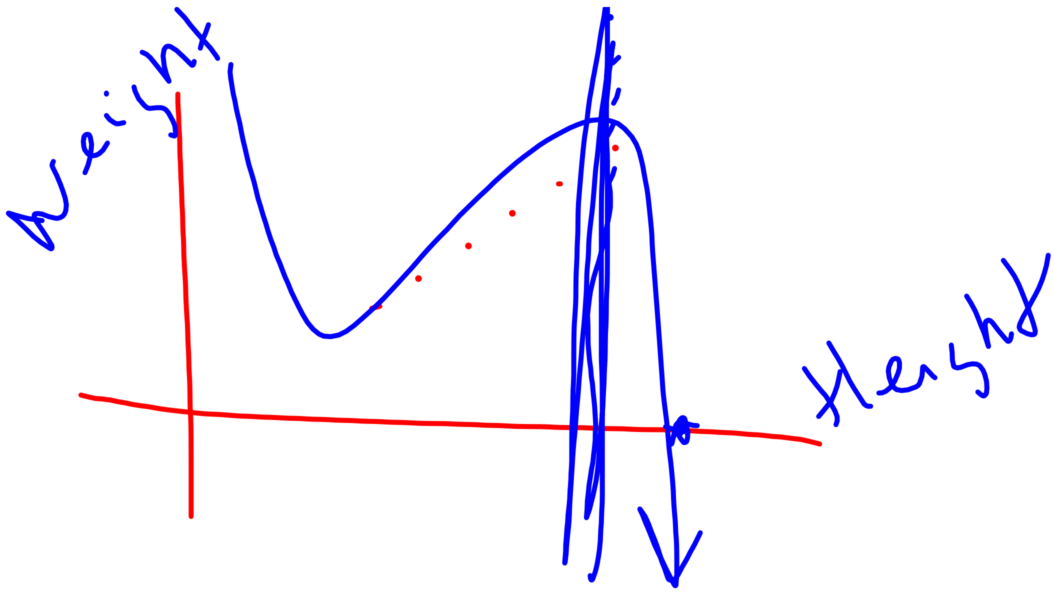
Project: Intersection Method

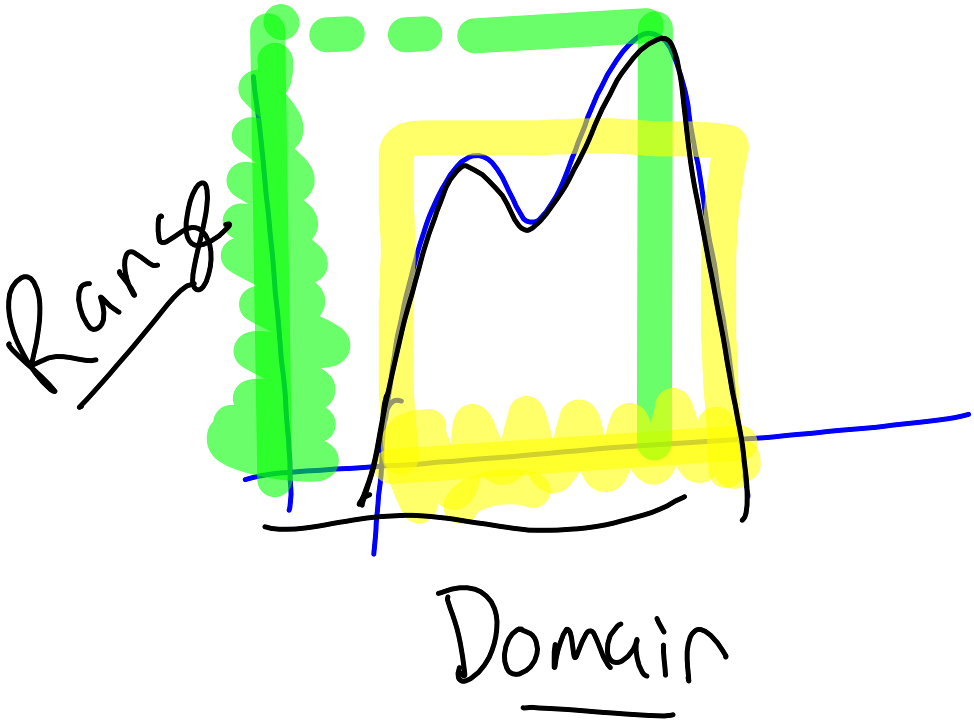
Zeros, Max/Mins, Domain, Range



According to chart...
The sales are 0
at 2017

Selling No chips


weight
Height


Range
Domain

Solving

Regression = value.

– Intersection method

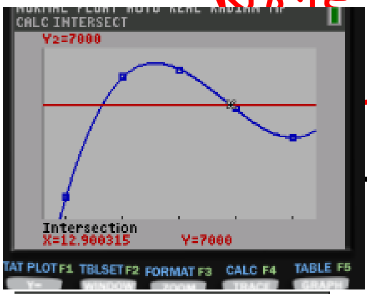
y_1 = regression

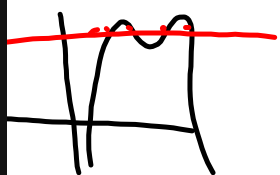
y_2 = value

Calc : 5 Intersect

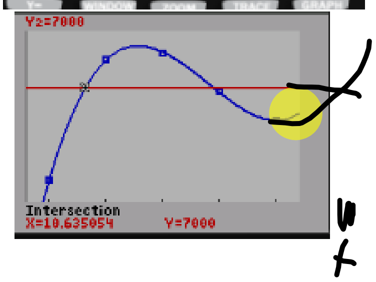
<enter><enter><enter>

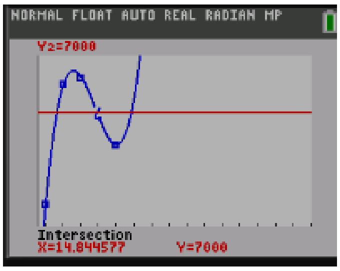
Note: you may have to adjust window





$y_2 = \$600$





Solver.

Math O: Solver

B: Solve

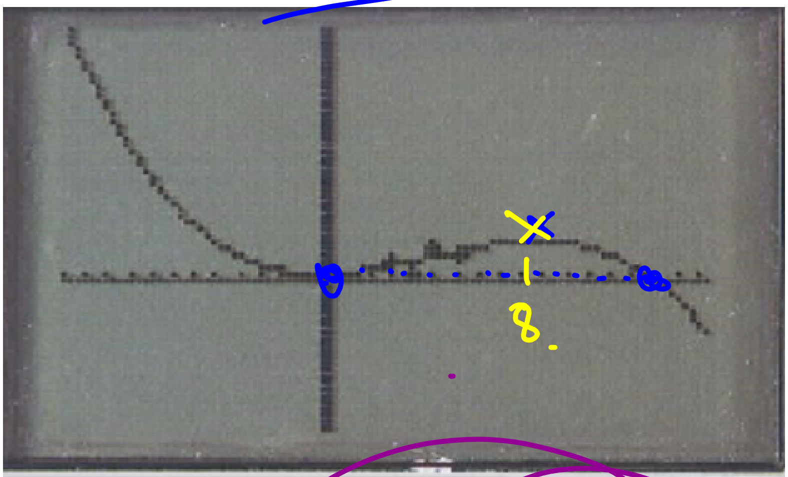
O = Regression − y

<alpha><1>

X = 1 <alpha><enter>

y = 6

Picture



Zeros: 0, 15.38

MATH

cubic(0) = 0

cubic(15.38) = 0

~~cubic(8) = 18.~~

Words

At 0, and 15 sell Nothing

between 0 and 15 we sell stuff according to cubic regression

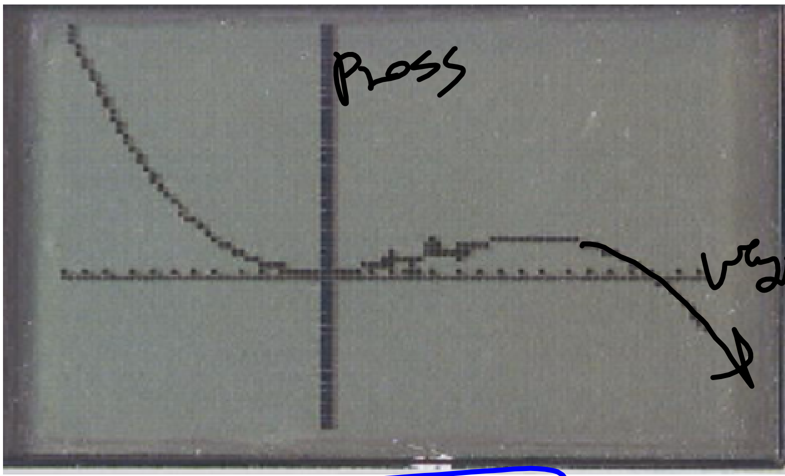
At 8 we'll sell max of 18

according to cubic regression

Math

Cubic Lead ⊖

Disco Left

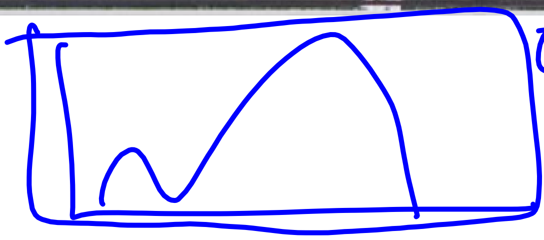


Weight Cubic ~~(−∞)~~ = +∞

~~Ass~~ Cubic (∞) = −∞

As gain weight actually lose ability to hear according to cubic

Math



Quartic

Quart Lead ⊖

Sad Parabola.

Review Week 3

Finding a polynomial of a given degree with given zeros: Complex zeros

Find a polynomial $f(x)$ of degree 3 with real coefficients and the following zeros.

$2, 2-i$

$(x-2)(x-2+i)(x-2-i)$

Finding a polynomial of a given degree with given zeros: Complex zeros

Find a polynomial $f(x)$ of degree 3 with real coefficients and the following zeros.

$2\ ,\ 2-i$

$2 \quad x-2 \quad (x-2)((x-2)-i)((x-2)+i) \quad i^2=-1$

$2-i \quad x-(2-i) \quad x^2-4x+4-i^2$

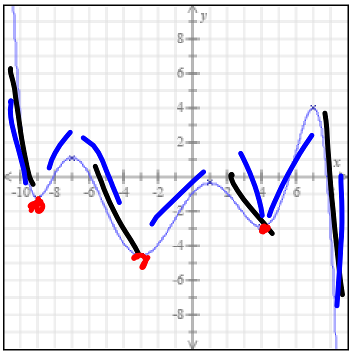
$2+i \quad x-(2+i) \quad x^2-4x+4-(-1)$

$(x^2-4x+5)(x-2) \Rightarrow$

$x^3-6x^2+13x-10$

$$\begin{array}{r} x^2-4x+5 \\ x-2 \\ \hline -2x^2+8x-10 \\ x^3-4x^2+5x \\ \hline x^3-6x^2+13x-10 \end{array}$$

Below is the graph of a polynomial function f with real coefficients. Use the graph to answer the following questions about f. All local extrema of f are shown in the graph.



(a) The function f is decreasing over which intervals? Choose all that apply.

☐ (-∞ , -9) ☐ (-7, -3) ☐ (-9, -3) ☐ (1, 4) ☐ (4, 7) ☐ (7, ∞)

(b) The function f has local minima at which x-values? If there is more than one value, separate them with commas.

-9, -3, 4

(c) What is the sign of the leading coefficient of f?

Select One ▾

Neg → Down Left

(d) Which of the following is a possibility for the degree of f? Choose all that apply.

☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

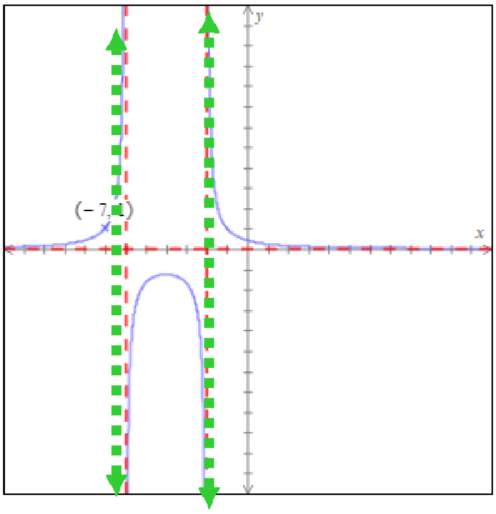
11

13

Writing the equation of a rational function given its graph

The figure below shows the graph of a rational function f.
It has vertical asymptotes $x = -2$ and $x = -6$, and horizontal asymptote $y = 0$.
The graph does not have an x-intercept, and it passes through the point $(-7, 1)$.

The equation for $f(x)$ has one of the five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
You can assume that $f(x)$ is in simplest form.



- $f(x) = \dfrac{a}{x-b}$
- $f(x) = \dfrac{a(x-b)}{x-c}$
- $f(x) = \dfrac{a}{(x-b)(x-c)}$
- $f(x) = \dfrac{a(x-b)}{(x-c)(x-d)}$
- $f(x) = \dfrac{a(x-b)(x-c)}{(x-d)(x-e)}$

$(-7, 1)$

$a = 5$

$y = \dfrac{}{(x+2)(x+6)}$

ZD: $-2, -6$

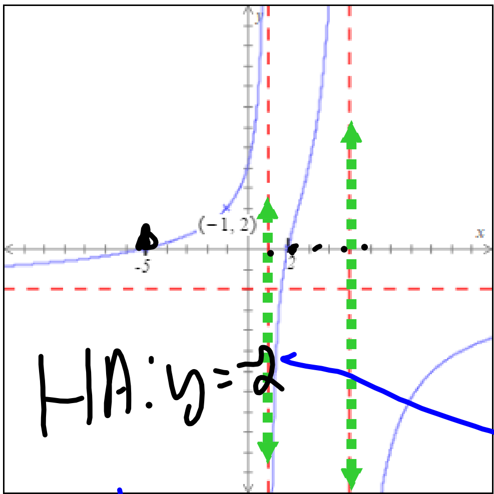
FD: $(x+2)(x+6)$

$1 = \dfrac{a}{(-5)(-1)}$

Writing the equation of a rational function given its graph

The figure below shows the graph of a rational function f.
It has vertical asymptotes $x=1$ and $x=5$, and horizontal asymptote $y=-2$.
The graph has x-intercepts 2 and -5, and it passes through the point $(-1, 2)$.

The equation for $f(x)$ has one of the five forms shown below.
Choose the appropriate form for $f(x)$, and then write the equation.
You can assume that $f(x)$ is in simplest form.



$\cancel{f(x) = \frac{a}{x-b}}$

$\cancel{f(x) = \frac{a(x-b)}{x-c}}$

$f(x) = \frac{a}{(x-b)(x-c)}$

$f(x) = \frac{a(x-b)}{(x-c)(x-d)}$

$f(x) = \frac{a(x-b)(x-c)}{(x-d)(x-e)}$

$\frac{LN}{LD} = \frac{-2}{1}$

ZN: -5 2

Factors: $(x+5)(x-2)$

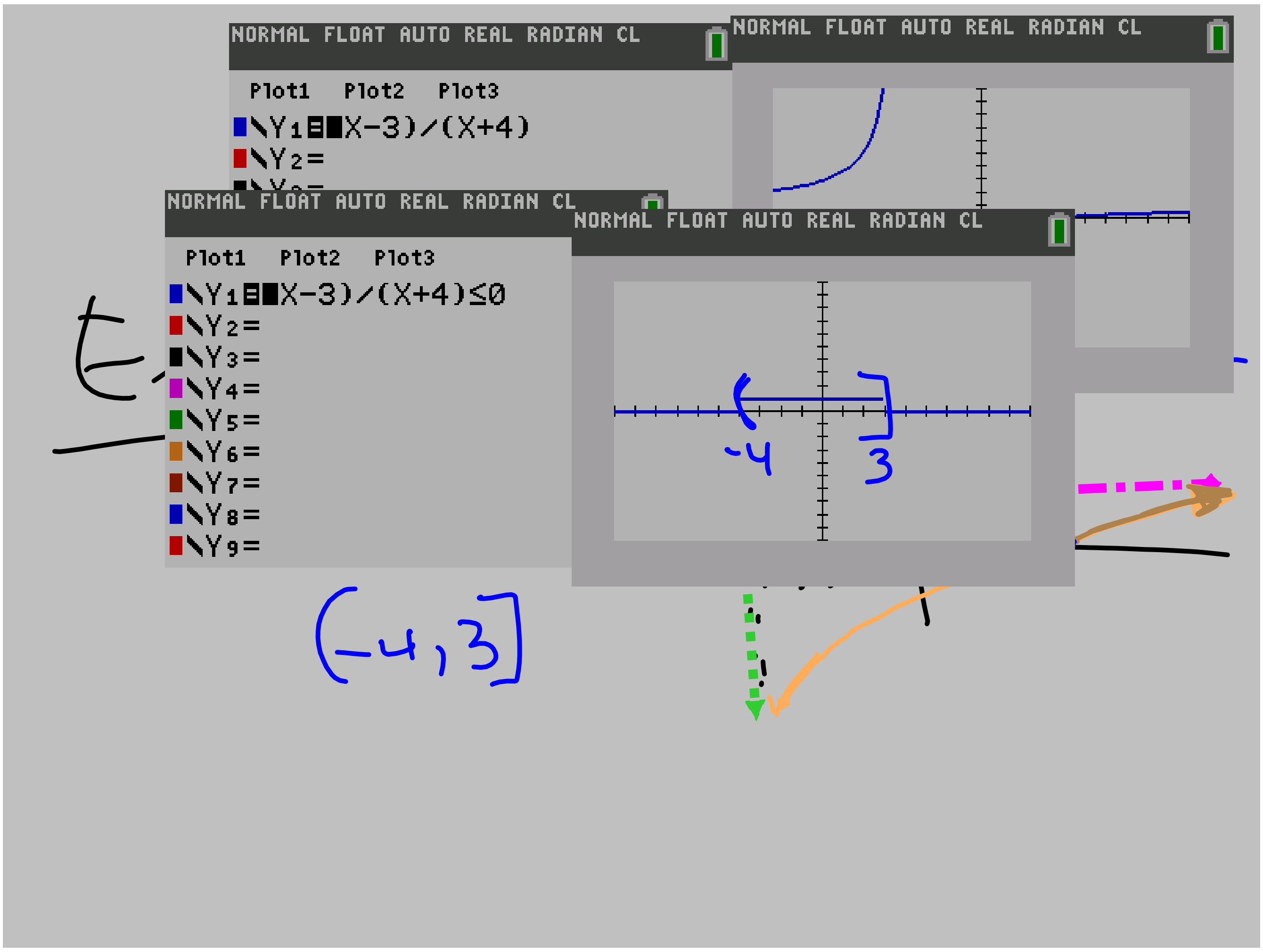
DN: 2

DD: 2

$y = \frac{a(x+5)(x-2)}{(x-1)(x-5)}$

Vertical Asymptotes come from the zeros of the denominator

Horizontal Asymptotes come from the degrees and leading coefficients


NORMAL FLOAT AUTO REAL RADIAN CL
Plot1 Plot2 Plot3
Y1=(X-3)/(X+4)
Y2=
NORMAL FLOAT AUTO REAL RADIAN CL
NORMAL FLOAT AUTO REAL RADIAN CL
Plot1 Plot2 Plot3
Y1=(X-3)/(X+4)≤0
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
Y8=
Y9=
NORMAL FLOAT AUTO REAL RADIAN CL
-4
3
(-4, 3]

$(x-2)(x-2)(x-2+3i)(x-2-3i)$

CLOSE WINDOW

Talking:

Using a given zero to write a polynomial as a product of linear factors: Co zeros

For the polynomial below, 2 is a zero of multiplicity two.

Factor $(x-2)^2$

x^2-4x+4

$$g(x) = x^4 - 8x^3 + 33x^2 - 68x + 52$$

Express $g(x)$ as a product of linear factors.

We are given that 2 is a zero of multiplicity two for $g(x) = x^4 - 8x^3 + 33x^2 - 68x + 52$. So by the factor theorem, there must exist a polynomial $Q(x)$ that satisfies the following equation.

$$x^4 - 8x^3 + 33x^2 - 68x + 52 = (x-2)(x-2)Q(x)$$

$x^2-4x+13$

To find $Q(x)$, we divide $x^4 - 8x^3 + 33x^2 - 68x + 52$ by $(x-2)(x-2) = x^2 - 4x + 4$.

$$\begin{array}{r|l} & x^2-4x+13 \quad \leftarrow Q(x) \\ x^2-4x+4 & x^4-8x^3+33x^2-68x+52 \end{array}$$

$2 \pm 3i$

$\dfrac{4 \pm \sqrt{16-52}}{2}$

$(x-2)(x-2)(x-2+3i)(x-2-3i)$

CLOSE WINDOW

Talking:

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$$\begin{array}{r l} & x^2 - 4x + 13 \quad \leftarrow Q(x) \\ x^2 - 4x + 4 \,\big) & x^4 - 8x^3 + 33x^2 - 68x + 52 \end{array}$$

$2 \pm 3i$

$\frac{4 \pm \sqrt{16-52}}{2}$

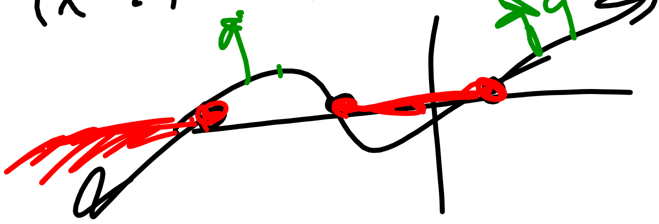
$x^3+4x^2 \le 4x+16$

$x^2(\cancel{x+4}) \le 4(\cancel{x+4})$

$x^2(x+4)-4(x+4)\le 0$ $\quad x^2 \le 4$

$(x^2-4)(x+4) \le 0$

$y=(x-2)(x+2)(x+4) \le 0$



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https://www-awb.aleks.com/alekscgi/x/Isl.exe/10xudACNhAhah-98FIE9r4YRUszFjLZjsvpNXJs-2QYjs7u71U

Talking:

Solving a polynomial inequality

Solve the inequality.

$$x^3+x^2<12x$$

Write your answer as an interval or union of intervals.
If there is no real solution, click on "No solution".

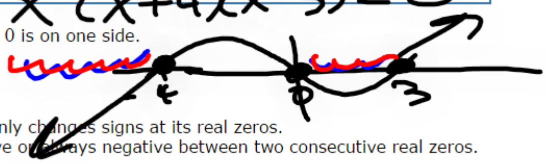
$x^3+x^2-12x<0$

$x(x^2+x-12)<0$

$y= x(x+4)(x-3)<0$

We first rewrite the inequality so that 0 is on one side.

$$x^3+x^2-12x<0$$



We'll use the fact that a polynomial only changes signs at its real zeros.
That is, a polynomial is always positive or always negative between two consecutive real zeros.

So, we'll find the real zeros of the polynomial x^3+x^2-12x.

$(-\infty,-4)\cup(0,3)$

$$x^3+x^2-12x = 0$$

$$x(x^2+x-12) = 0$$

5:02 PM
9/21/2016

Solving a rational inequality: Problem type 1

Solve the following inequality.

$$\frac{x-3}{x-7} \geq 0$$

Land

Write your answer using interval notation.

$y = \frac{x-3}{x-7}$ DN:1 LN:1 ZN:3

DD:1 LD:1 ZD:7

END

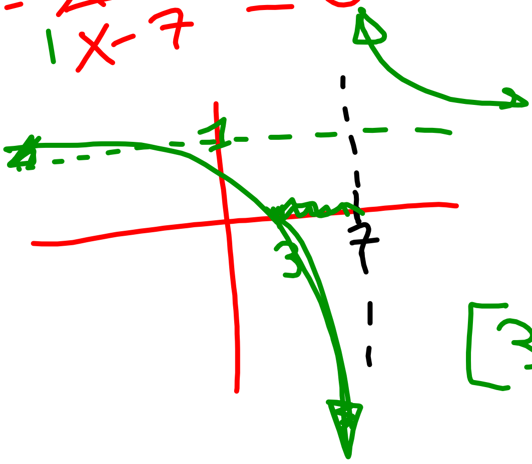
HA: $y = \frac{LN}{LD} = 1$

$(-\infty, 3] \cup (7, \infty)$

$\frac{3-3}{3-7} = 0 \geq 0$ yes

(Don't Include VA)

$$y = \frac{x-3}{x-7} \le 0$$



$[3, 7)$

Talking:

[close window]

Schrader, Kenneth G. / Quiz 3, Date Submitted: 09/21/2016

2. Using a given zero to write a polynomial as a product of linear factors: Complex zeros

For the polynomial below, 3 is a zero.

$$g(x) = x^3 + x^2 + x - 39$$

Express $g(x)$ as a product of linear factors.

$$x^2+4x+13 = 0$$

$$x-3 \,\overline{\big)\, x^3+x^2+x-39}$$

$$-(x^3-3x^2)$$

$$4x^2$$

$$-(4x^2-12x)$$

$$13x-39$$

$$-(13x-39)$$

You answered:

$$g(x) = (x-3)(x+3i)(x-3i)$$

Your answer is incorrect.

$$x = -2 \pm 3i$$

The correct answer is:

$$(x+2-3i)(x+2+3i)$$

$$g(x) = (x-3)(x-(-2+3i))(x-(-2-3i))$$

Adjust the Points for This Answer:

Current Points: 0 of 1 point

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9/21/201