Rational Functions

$P(x)$ — Zeros (Touch, Pass, Jig) — Degree — Lead

Numerator → $\frac{P(x)}{q(x)}$ ← Denominator

	Degree	Lead
ZN	DN	LN
ZD	DD	LD

Ex $y = \frac{5x^2}{x^1 - 1x^0}$ ZN: 0, 0 ZD: 1 DN: 2 LN: 5 DD: 1 LD: 1

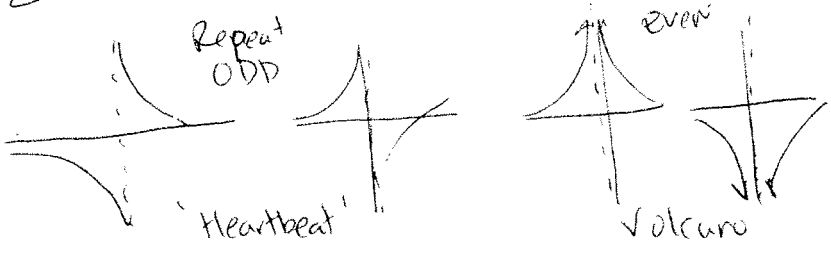
$x_{\text{INTERCEPTS}}$ = Zeros of Numerator = ZN

$y_{\text{INTERCEPT}}$ = $y(0)$ evaluate

END BEHAVIOR (what happens at ∞ and $-\infty$) = Slant or Horizontal Asymptote

Vertical Asymptote = Zeros of Denominator = ZD

$x =$



END Behavior

DN > DD

Slant Asymptote.

Disco / Happy Parabola Ending

Ex $\frac{5x^2}{x-1}$

$$x-1 \;\overline{)\; 5x^2 + 0 + 0}$$

$$5x + 5 + \frac{5}{x-1}$$

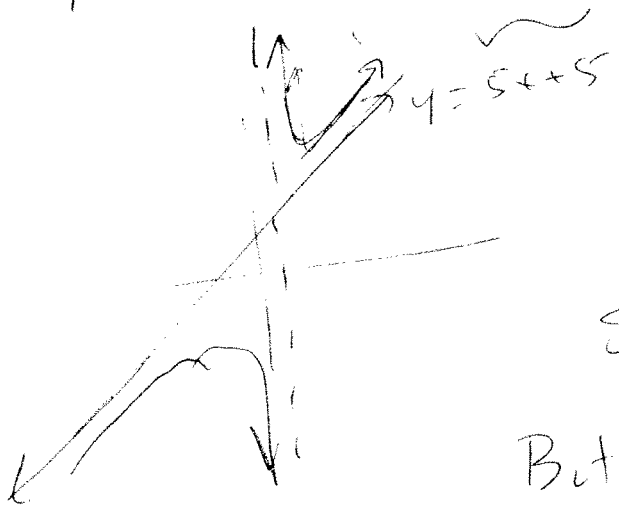
$$-(5x^2 - 5x)$$

$$5x + 0$$

$$-(5x - 5)$$

$$5$$

$$\frac{5x^2}{x-1} = 5x + 5 + \frac{5}{x-1}$$



Slant $y = 5x + 5$

But END Behaviour

Disco Right

Lead ⊕, Degree (1)

Degree Slant = DN − DD

Lead Slant = $\frac{LN}{LD}$

Ex $y = \frac{3(x-5)^{20}}{-7(x+3)^{14}}$

DN = 20 LN: 3

DD = 14 LD: −7

DS = 6 LS $-3/7$ ⊖

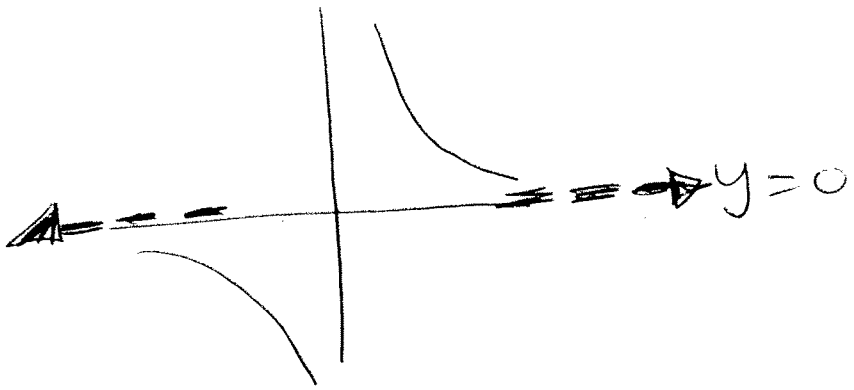
END Behavior

SAD Parabola

DN < DD

Horizontal Asymptote

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

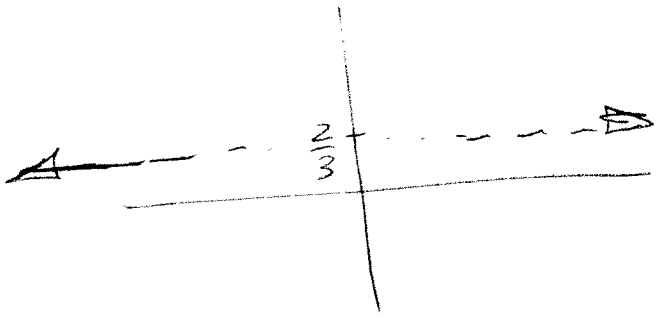


DN = DD

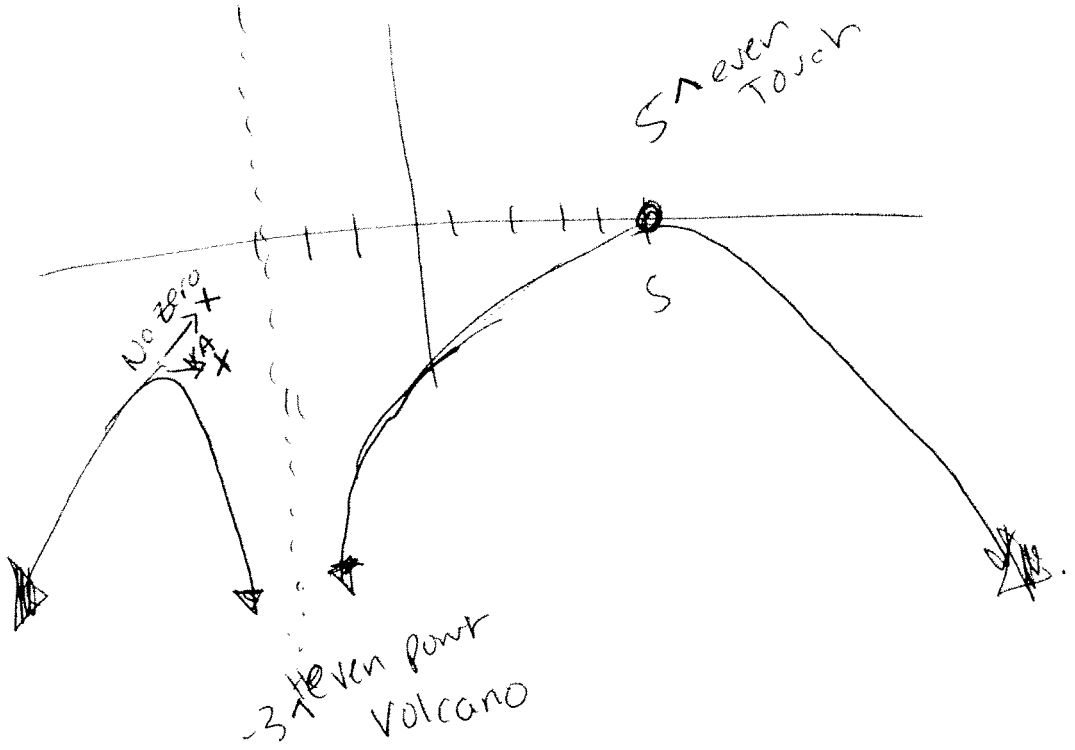
Horizontal Asymptote

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

Ex $y = \frac{2x}{3x-1}$ HA: $y = \frac{LN}{LD} = \frac{2}{3}$



Ex $y = \dfrac{3(x-5)^{\cdots}}{-7(x+3)^{14}}$ ← even



Groups

$$y = \frac{200(x-42)^{11}(x+17)^{8}}{165(x+20)^{8}(x-25)^{7}}$$

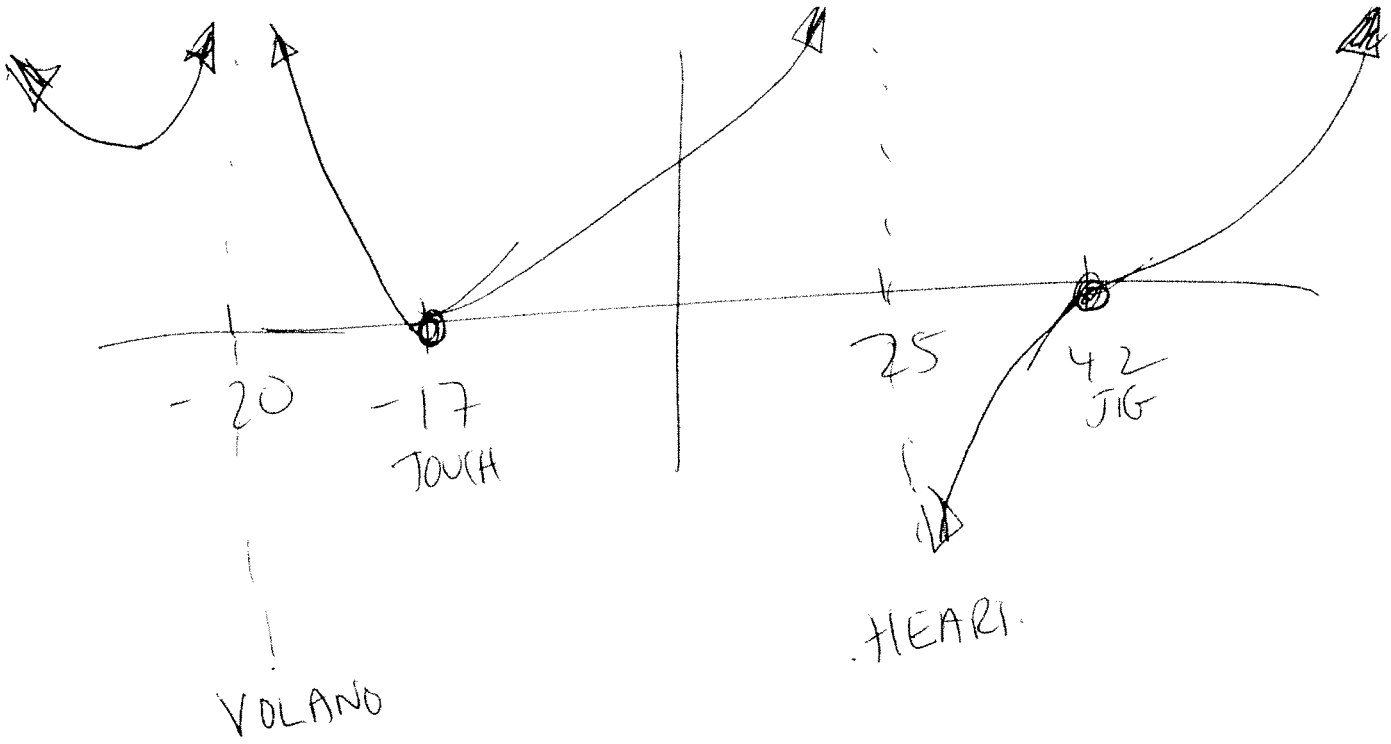
Heaviest — Bad Day — shoe size — MEN

Lightweight — WOMEN

Zeros: 42, −17
PASS, TOUCH

VA: −20, 25
VOLCANO, HEARTBEAT

END: DN = 19 → Slant DS = 4 (even) LS = $\frac{200}{165}$ (+)
DD 15
Happy Parabola


-20
-17
TOUCH
25
42
JIG
VOLANO
HEART

GROUP NAME: MONTANA **Logo:**	**Student Names (First and Last)** **Speaker/Presenter:** Brandon Rivera **Writer/Prep:** Sharon Guzman **QC/Leader:** Darshit Jariwala
Date: **Topics:**	

Instructions:

$$\frac{166(x-21)^{10}}{130(x-19)^{8}} \quad \frac{137(x+20)^{9}}{}$$

a Slant Asymptote

DN = 19
DD = 8
LN = 29.7
LD = 130

DN - DD
19 - 8 = 11 = Degree slant
Disco.
Right

ZN: 21, −20 (Touch (10), Pass (9))

ZD: 19 (vac (8))

GROUP NAME: I L M	**Student Names (First and Last)**
Logo:	**Speaker/Presenter:**
Date: 09/28/2013	**Writer/Prep:**
Topics: Rational Function	**QC/Leader:**

Instructions: Make a polynomial function
- Find zero.
- Find VA.
- Find END.

$$y = \frac{180(x+25)^{10}(x-18)^{9}}{170\cdot(x-30)^{8}}$$

DN = 19
DD: 8
DS = 11

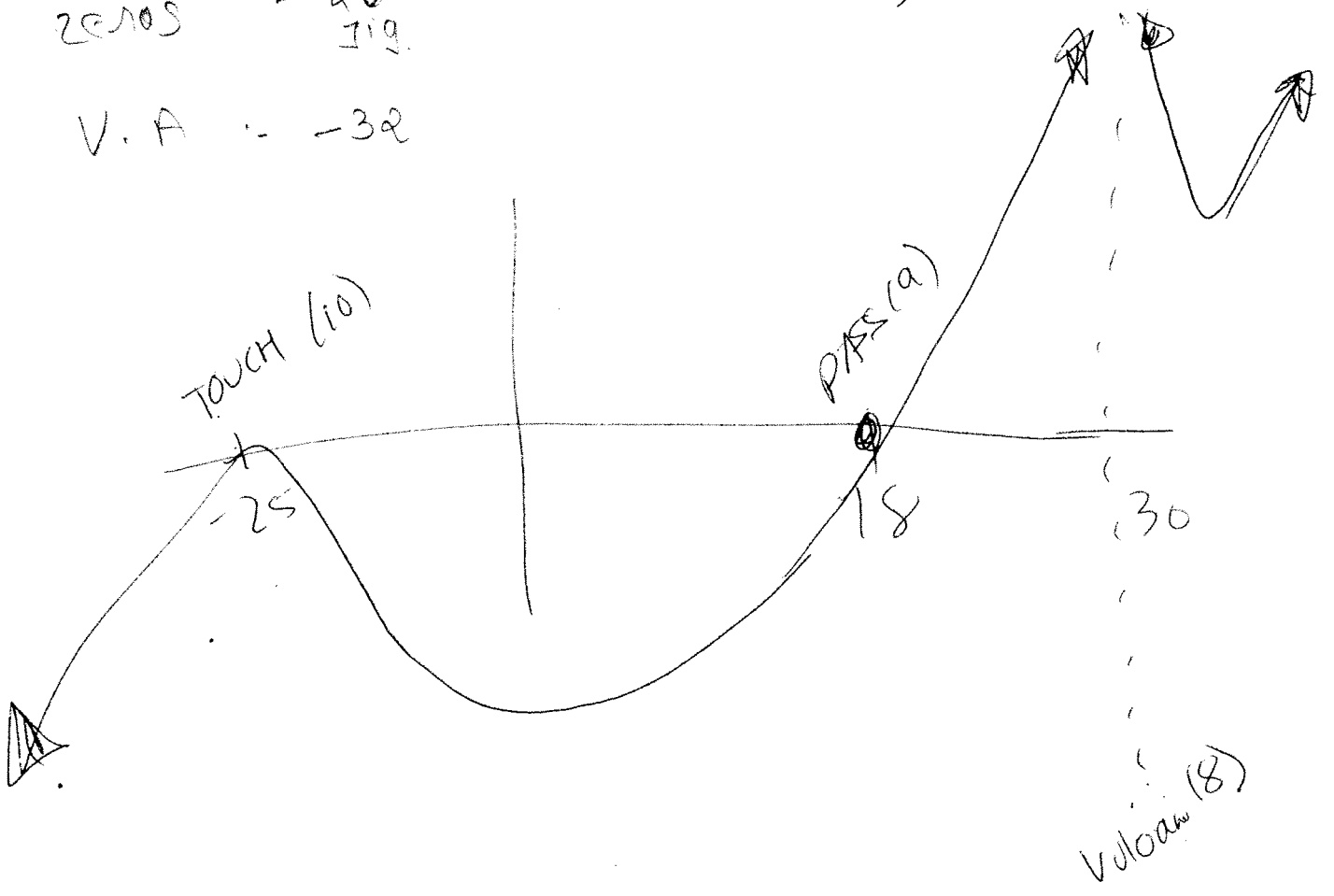
LN = 180
LD = 17

DISCO

LS = (+
RS:

zeros: -20, -25, 18

V.A : -32



GROUP NAME: I L I N

Logo:

Date: 09/18/2013

Topics: Rational Functions.

Student Names (First and Last)

Speaker/Presenter: Jake Peebles

Writer/Prep: Hiral Desai

QC/Leader: Kevin Velasquez

Instructions: make polynomial
- find zero
- find
- End behavior.

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

Zeros: -3 (Touch) 5 (Pass.)

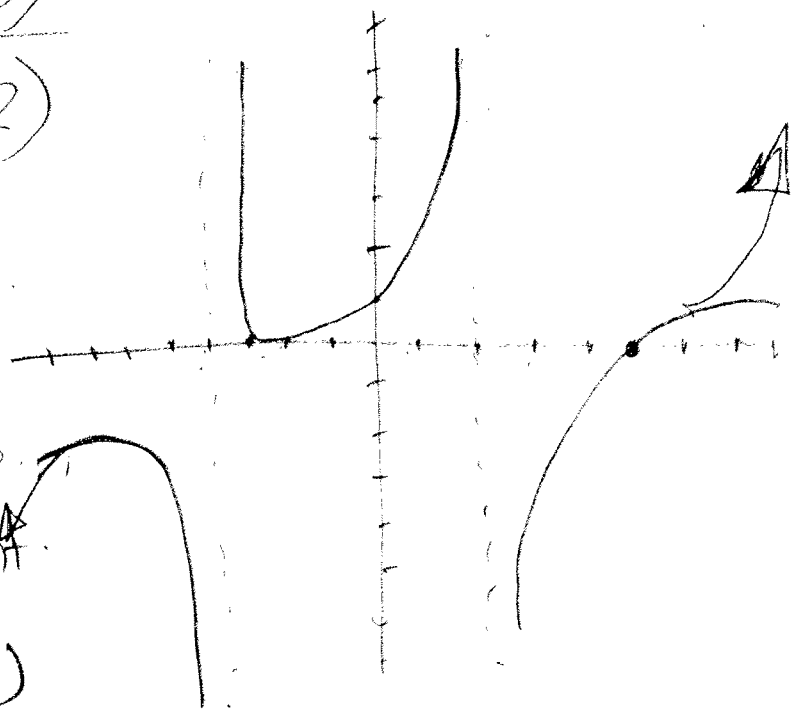
V.A: -4 (H.B) 2 (H.B.)

END: $\frac{DN}{D.D} \; \frac{5}{-4}$ → Slant.

D.S = 5 − 4 = 1 (even)

LS = $\frac{2}{5}$ (positive).

Fall Left Rise-Right



GROUP NAME: Greatest at work	**Student Names (First and Last)**
Logo:	**Speaker/Presenter:** Natalie Castillo
Date: 9/18/13	**Writer/Prep:** LAUREN DOBO
Topics:	**QC/Leader:** Kerbi Singh

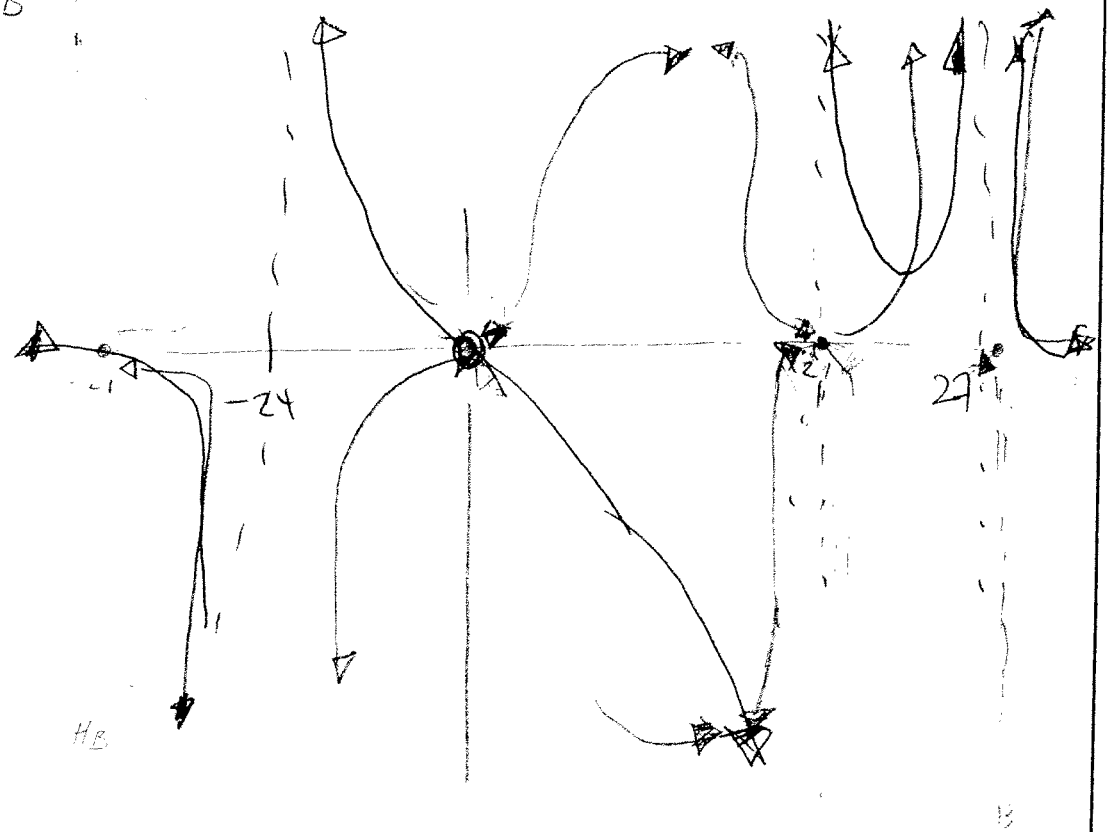
Instructions:

$$y = \frac{x}{110(x+24)^7(x-22)^8(x-21)^7}$$

ZEROS: 0

VA: -24, 22, 21
HB VOLC HB

DS: $\frac{1}{22} = -21$
LS: $\frac{1}{110} = \ominus$



GROUP NAME:	Student Names (First and Last)
Logo:	Speaker/Presenter: Kaycalyn Manner
Date:	Writer/Prep: Racheal Joyce
Topics:	QC/Leader: Alex Houtenville

Instructions:

$y = \frac{155(x+20)^{10}}{78(x+19)^{9}(x+18)^{16}}$ =

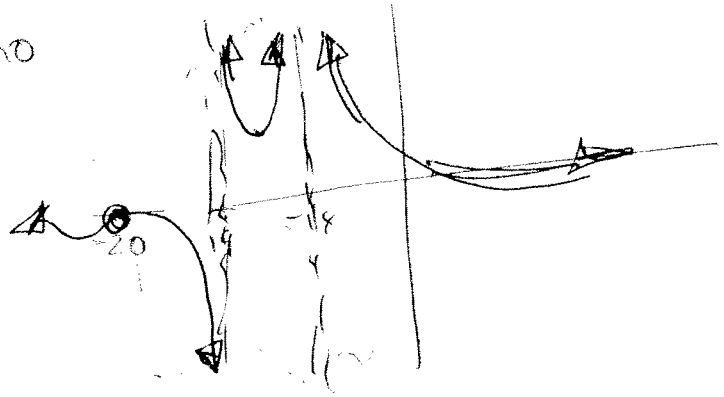
even degree
↙ volcano ↘ touching

odd degree
↙ heart beat ↘ passing through

Zeros: -20
touching

VA: -19 -18
Heart beat volcano

End behavior



DN DD
158 78

DN 10
DD 15 → Horizontal Asymptote
y = 0

GROUP NAME:

Logo: I ♡ MATH

Date: 09/18/2013

Topics: RATIONAL HK

Student Names (First and Last)

Speaker/Presenter: Sharon Isee

Writer/Prep: Onur Turkan

QC/Leader:

Instructions:

$$y = \frac{170\,(x-30)^9\,(x+2)^8}{130\,(x-21)^9\,(x-1)^5}$$

touch ↓ Pass

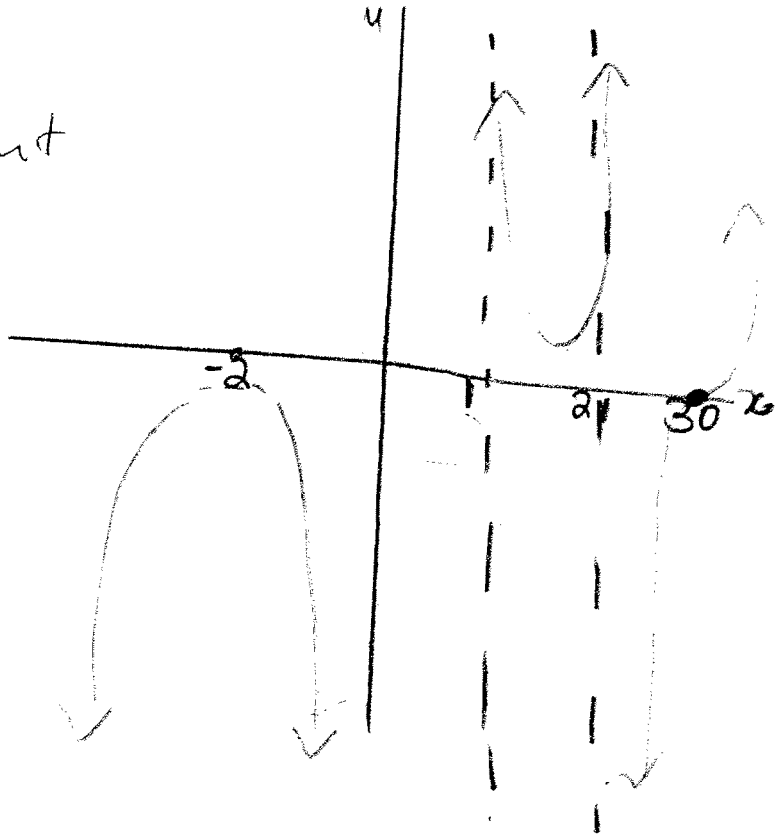
zeros $(-2, 30)$

21 → heartbeat.

1 → heartbeat.

$\frac{17}{14}$) (3) degree odd slant

$\frac{15.170}{140}$ = (+) coefficient



GROUP NAME: Athletics **Logo:**	**Student Names (First and Last)** **Speaker/Presenter:** Harrison Sanders
Date: **Topics:**	**Writer/Prep:** Vinnie Author **QC/Leader:** Jim Kukral

Instructions:

$$\frac{240\,(x-27)^{10}(x+21)^{12}}{135\,(x+10)^{12}(x-10)^{12}}$$

Zeros: +27, -21

+ multiplicity, + multiplicity

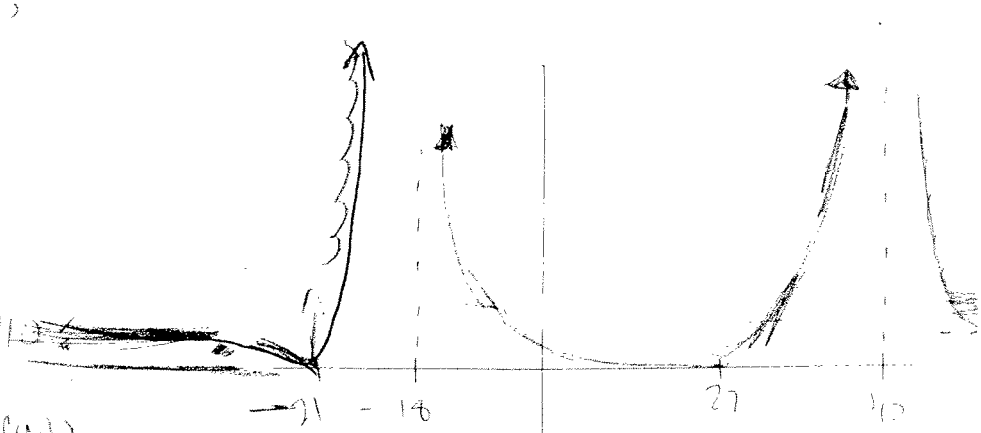
V/A: -10, +10

Volcano, Volcano

End DN: 22

DS: 22

HA: DN = $\frac{240}{135} = 2.1$



GROUP NAME: I ♥ Math	**Student Names (First and Last)**
Logo:	**Speaker/Presenter:** Nicole Bonelli
Date: 9/13/23	**Writer/Prep:** Avik Khanejo
Topics:	**QC/Leader:**

Instructions: $y = \frac{30(x-19)^9}{15(x-24)^6}$

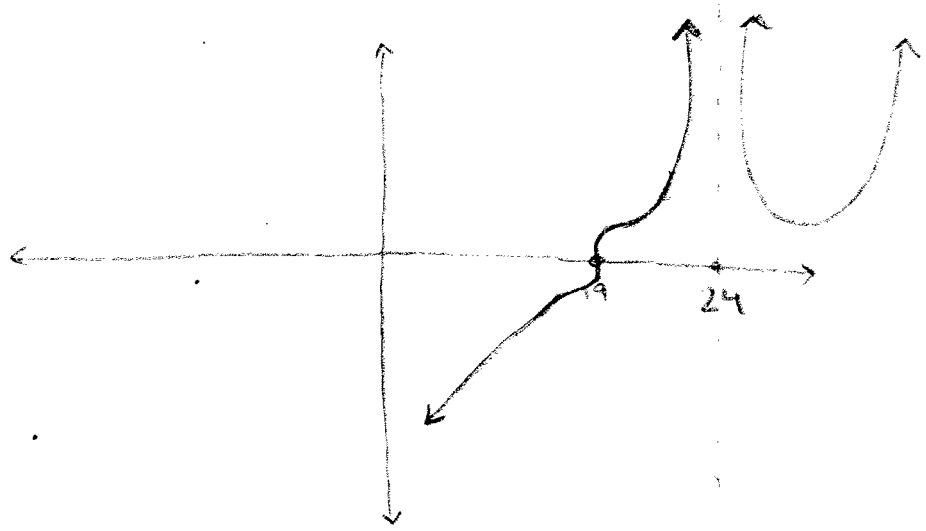
$y = \frac{30(x-19)^9}{15(x-24)^6}$ ZN: 19 DN: 9 LN: 30
ZD: 24 DD: 6 LD: 15

DN > DD
↳ Slant

Degree Slant: 9 − 6 → [3] odd } Disco Right
Lead Slant: $\frac{30}{15}$ = [2] ~~pos~~ positive +

Zero: 19 (Pass through a/c 9 is odd)

VA: 24 (Pos Volcano)



GROUP NAME: Business Crew

Logo: BC

Date: 9/18

Topics: Asymptotes

Student Names (First and Last)

Speaker/Presenter: Stan Kaplan

Writer/Prep: Lauren Sinclair

QC/Leader: Danyan Zhou

Instructions:

$$y = \frac{165(x-26)^{11}}{145(x-24)^8\ 156(x+32)^8}$$

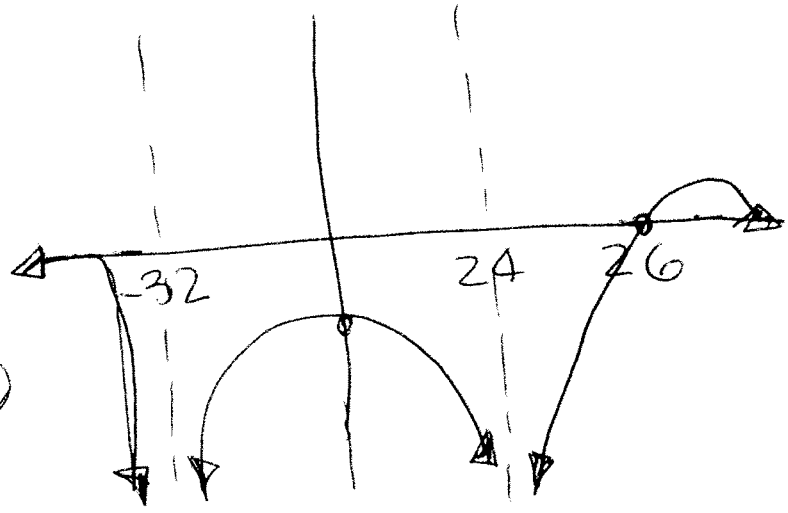
zero = 26 (11 is odd so passing through)

VA = 24 (volcano) −32 (volcano)

end = $\frac{11}{16}$ = y = 0

Horizontal Asymptote

$$y(0) = \frac{165(-26)^{11}}{145(-24)^8(32)^8} = \ominus$$



GROUP NAME:	Student Names (First and Last)
Logo:	Speaker/Presenter: Scott
Date:	Writer/Prep: Scott
Topics:	QC/Leader: Scott

Instructions:

$$\frac{200(x+26)^{10}(x+2)^{9}}{100(x+20)^{8}(x-1)^{7}}$$

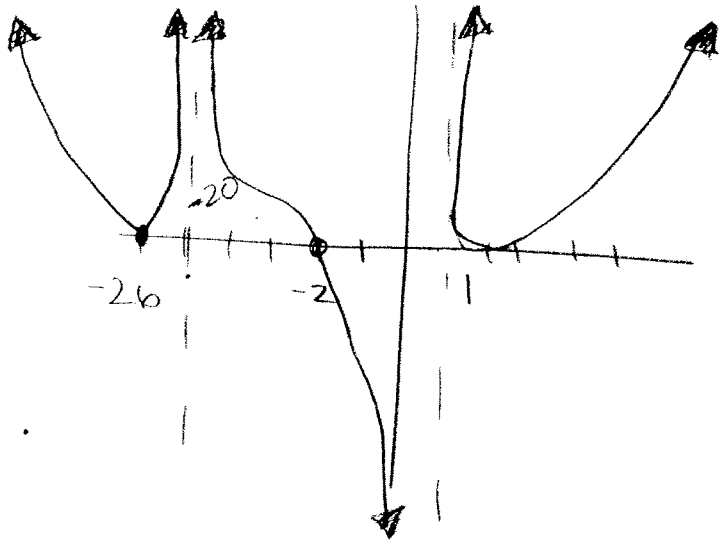
$\frac{19}{15} = \{DS = 4\}$ PARABOLA

200 ÷ 100 = 2 (+)

Zeroes: (-2, -26) P T

VA: -20, 1

Volcano heartbeat

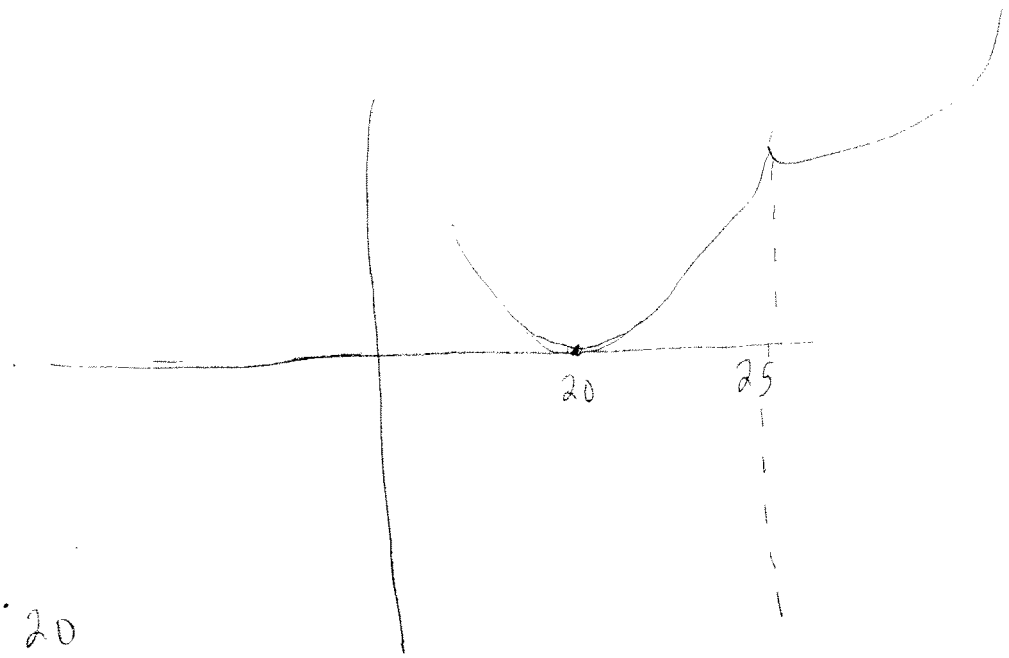


GROUP NAME:	**Student Names (First and Last)**
Logo:	**Speaker/Presenter:** Tatiana C.
Date:	**Writer/Prep:** Trey
Topics:	**QC/Leader:** Dominique

Instructions:

$y = \frac{170(x-20)^{10}}{100(x-25)^{8}}$ DN: 10 LN: 170 ZN: 20

DD: 8 LD: 100 ZD: 25



Zero 20

VA : 25