Math notes:

$\boxed{\text{Finding Domain: Set all Denominator Values} = 0}$

- all log have range of $(-\infty, \infty)$
- all exponential functions have a domain $(-\infty, \infty)$
- all Polynomial functions have Domain of $(-\infty, \infty)$

Finding VA: Set Denomintor $= 0$

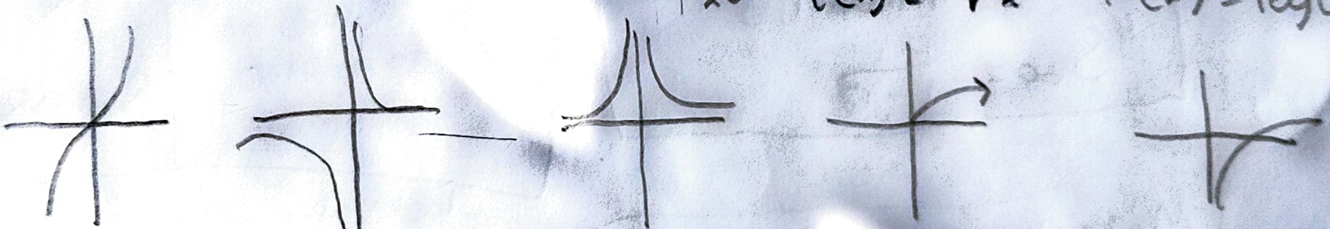
Finding HA: Degree of $N(x)$ < degree of $D(x)$ HA $= 0$
Degree of $N(x)$ = degree of $D(x)$ HA ratio of lead co

Finding slang Asy: Do long division when degree of $D(x)$ > $N(x)$

Tool kit functions

$f(x) = c$ $\quad f(x) = x$ $\quad f(x) = |x|$ $\quad f(x) = x^2$ $\quad f(x) = \sqrt[3]{x}$

$f(x) = x^3$ $\quad f(x) = \frac{1}{x}$ $\quad f(x) = \frac{1}{x^2}$ $\quad f(x) = -\sqrt{x}$ $\quad F(x) = \log(x)$



log formulas: $y = \log_b x \rightleftarrows x = b^y$ $\quad \boxed{\text{log Prop}} =$

$\ln(x) = \log_e(x)$

$$\boxed{\begin{aligned} \log_b(xy) &= \log_b x + \log_b y \\ \log_b\left(\frac{x}{y}\right) &= \log_b x - \log_b y \\ \log_b x^n &= n \log_b x \end{aligned}}$$

$\log_b 1 = 0 \quad b^0 = 1$

$\log_b b = 1 \quad b^1 = 1$

$\log_b b^x = b^x = b$

if $\log_b x = \log_b y = x = y$

Steps to factor Polynom
with co-efficient > 1
- Take coeff & * 3rd
- Q 2 factors of * 3rd te
& add them ↑ middle term

Quadratic formula $= x = - \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Vertex form: $y = a(x-h)^2 + k$

vertex $= H, K$

$H = \frac{-b}{2a}$

$K = f(H)$

Matrix notes

$3\times 1 \cdot 1\times 3$

has to be same

size of new matrix

$$\begin{bmatrix} 1 & 1 \\ 2 & 2 \\ 3 & 3 \end{bmatrix}$$

3×2

$$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{bmatrix}$$

$2\cdot 3$

inverting a matrix

$f(x) = f(-x)$

$$\left[\begin{array}{ccc|ccc} 3 & 4 & 2 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ -2 & -2 & -1 & 0 & 0 & 1 \end{array}\right]$$

row echelon form if
- 1st $\neq 0$ is 1
- leading 1 of each row must be right of any leading 1s
- All zero row must be at bottom

reduced row form if
- matrix in ref
- lead 1's are only $\neq 0$'s

Aritmetic formulas

$d = a_n - a_{n-1}$

$a_n = a_1 + (n-1)d$

Geometric formula

$r = \frac{a_n}{a_{n-1}}$

$a_n = a_1 r^{n-1}$

Partial sum notes:

$S_n = n/2\,(a_1 + a_n)$

$a_n = a_1 + (n-1)d$

$S_\infty = \frac{a_1}{1-r}$

Row operations:

- Swap 2 rows	$R_1 \leftrightarrows R_2$
- Multiply row by $\neq 0$	$a\cdot R_i \to R_i$
- Add a multiple of a row to another	$R_i + aR_j \to R_i$

Methods for solving groups of equations
- Substition
- elimination

last value of n

$$\sum_{n=1}^{6} t_n$$

formula of term

index of sum

first value of n

U1315467

Ricardo Baeza

I Pledge that I will not give or receive any unauthorize help on this exam, and that all work will be my own I under stand that any breach of this pledge constitutes Academic dishonesty as Defined by the University of Utah Code of Student rights and Responsibities

1. a. $(-2,0),\ (1,0)$

$$\begin{array}{r|rrrr} -2 & 1 & 1 & 3 & -6 \\ & \downarrow & -2 & 2 & 6 \\ \hline & 1 & -1 & 3 & -3 \; 0 \end{array}$$

b. $(0,6)$

c. $(-\infty,\infty)$

D. $(-\infty, 8]$

e.

$$\begin{array}{r|rrrr} 1 & 1 & -1 & 3 & -3 \\ & \downarrow & 1 & 0 & 3 \\ \hline & 1 & 0 & 3 & 0 \end{array}$$

F.

x^2+3

g $(-2,0)(1,0)(-\sqrt{3}i,0)(\sqrt{3}i,0)$ $\frac{0 \pm \sqrt{0^2-4(1)(3)}}{2(1)}$

H.

$(-\infty,-2) \cup (1,\infty)$

$0 = a(x+2)(x-1)(x+\sqrt{3}i)(x-\sqrt{3}i)$

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

a. $\boxed{\frac{1}{2}}$

$\frac{0-1}{0^2-3(0)+2} = -\frac{1}{2}$

b.

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

c. $(-\infty, 1) \cup (1, 2) \cup (2, \infty)$

D. hole @ $(1,-1)$

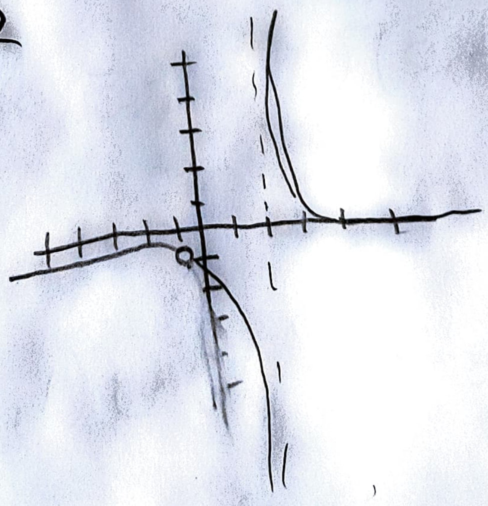
$\cancel{\frac{(1)-1}{1^2-3(1)+2}}$ $\frac{1}{(1)-2} = -\frac{1}{1}$

e xint. $= 1$

f. $y=2$

g. $y=0$

h. $\rightarrow$



3.

a. Sequence is geometric

b. $50000 + (n-1)2$

$\cancel{4 = 50000 + (n-1)2}$

$\cancel{50000 + 2n - 2}$

$\cancel{4 = 49998 + 2n}$

$\cancel{-49998}$

$\cancel{-49994 = \frac{2n}{2}}$

c.

$$\sum_{n=4}^{n} 500000 \cdot 2^{n-1}$$

d.

$$\frac{800000}{50000} = \frac{50000 \cdot 2^{n-1}}{50000}$$

$16 = 2^{n-1}$

$\log_2(16) = n-1$

$4 = n-1$

$4+1 = n$

$\boxed{8\text{th day}}$

4.

$f(x) = 3^{2x-3}$

$x = 3^{2(y)-3}$

$\log_3 x = 2y - 3$

$\quad +3 \qquad +3$

$\dfrac{\log_3 x + 3}{2} = \dfrac{2y}{2}$

a. C

$\boxed{\dfrac{\log_3 x + 3}{2} = y}$

b

$y = 3^{2(0)-3}$ $\quad 3^{-3} = \dfrac{1}{27}$

$\boxed{y\text{-int} = \dfrac{1}{27}}$

c. horizontal $y=0$

D vertical $x=0$

e

$\dfrac{1}{81} = 3^{2x-3}$

$\log_3 \dfrac{1}{81} = 2x-3$

$-4 = 2x - 3$

$+3 \qquad +3$

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

$\boxed{-\dfrac{1}{2} = x}$

5.

a. $\begin{bmatrix} 5 & 10 & 25 \\ 1 & 0 & 1 \\ 0 & -1 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 330 \end{bmatrix}$

1·3 $\quad$ 3×1

$$\begin{cases} 5x + 10y + 25z = 330 \\ x + z = 12 \\ -y + z = 3 \end{cases}$$

$q =$

b. A

c. $\left[\begin{array}{ccc|ccc} 5 & 10 & 25 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 \\ 0 & -1 & 1 & 0 & 0 & 1 \end{array}\right] \xrightarrow{R_1 \leftrightarrow R_2} \left[\begin{array}{ccc|ccc} 1 & 0 & 1 & 0 & 1 & 0 \\ 5 & 10 & 25 & 1 & 0 & 0 \\ 0 & -1 & 1 & 0 & 0 & 1 \end{array}\right]$

6.

even = symetric over y-axis

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

$\sqrt{2} = x$

$a = (2,0)\ (-2,0)$

$b = \ x = -1,\ x = 1$