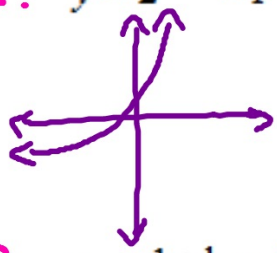
Day 46 Warm-Up:

Sketch the following then state the domain and range

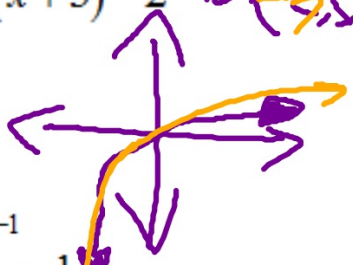
1. $y = 2^{x+3} - 1$



D: $(-\infty, \infty)$

R: $(-1, \infty)$

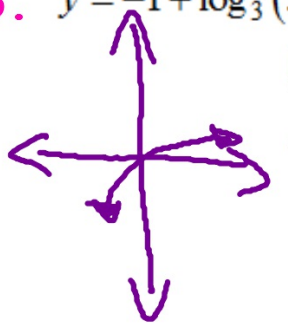
2. $y = \log_2(x+3) - 2$



D: $(-3, \infty)$

R: $(-\infty, \infty)$

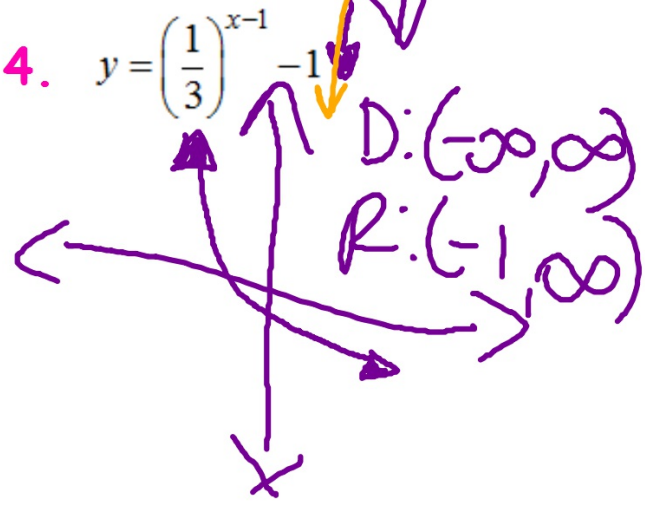
3. $y = -1 + \log_3(x+2)$



D: $(-2, \infty)$

R: $(-\infty, \infty)$

4. $y = \left(\frac{1}{3}\right)^{x-1} - 1$



D: $(-\infty, \infty)$

R: $(-1, \infty)$

1. $\frac{4}{x}+\frac{1}{x^2}=\frac{1}{5x^2}$ $\left\{-\frac{1}{5}\right\}$

2. $\frac{x-5}{x^2}+\frac{1}{x}=\frac{6}{x}$ $\left\{-\frac{5}{4}\right\}$

3. $\frac{4}{n+1}+\frac{1}{n^2-5n-6}=\frac{1}{n-6}$ $\{8\}$

4. $\frac{5}{p+6}-\frac{1}{p^2+6p}=\frac{2}{p^2+6p}$ $\left\{\frac{3}{5}\right\}$ = .6

5. $\frac{5}{(x+1)}=\frac{6}{(x^2-2x-3)}+\frac{1}{(x-3)}$ $\left\{\frac{11}{2}\right\}$

6. $\frac{k+1}{k}=1-\frac{k^2-3k-4}{4k}$ $\{3\}$

Checking with two different methods

zoom box

Y_1 Y_2

(5 /(p + 6)-(1/(p^2+6p

2nd trace (calc)
5: intersect

Given $f(x) = \frac{g(x)}{h(x)}$	Factor g(x) and h(x), then cancel common factors.
Vertical Asymptotes	Set the denominator = 0 and solve for x.
Holes (point discontinuity)	Set cancelled factors = 0 and solve for x. Substitute x into the simplified expression to find y. Write the answer as an ordered pair.

Horizontal Asymptotes

$1/2 = .5 \quad 1/10 = .1 \quad 1/152 = .0066$

$f(x) = \frac{\text{smaller degree}}{\text{larger degree}}$ $\frac{x^2}{x^3}$	y = 0
$f(x) = \frac{\text{same degree}}{\text{same degree}}$ $\frac{2x^4}{3x^4}$	$y = \frac{\text{lead coeficient of numerator}}{\text{lead coeficient of denominator}}$
$f(x) = \frac{\text{larger degree}}{\text{smaller degree}}$ $\frac{x^6}{x^3}$	none

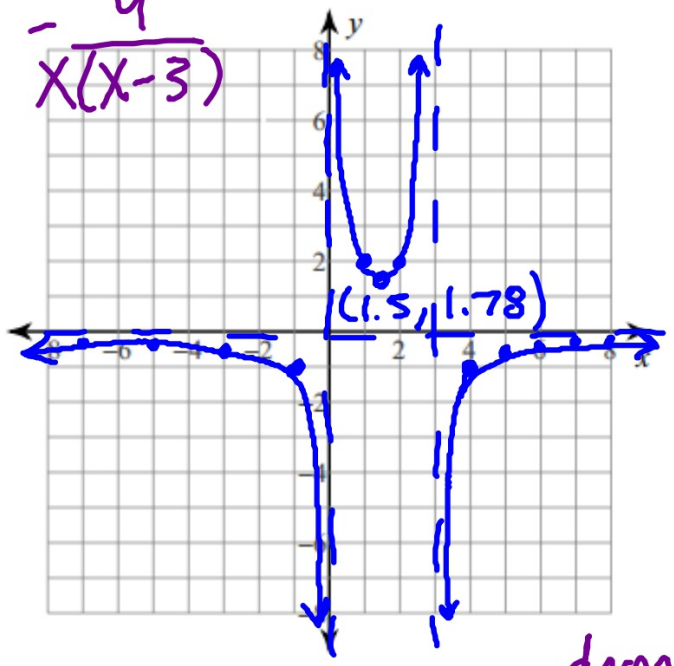
$\frac{1}{1287} = .000777$

$\frac{2}{1} = 2 \quad \frac{10}{1} = 10 \quad \frac{152}{1} = 152 \quad \frac{3873}{8}$

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

① Factor & Simplify

$$-\frac{4}{x(x-3)}$$



Domain: $(-\infty, 0) \cup (0, 3) \cup (3, \infty)$

Range: $(-\infty, 0) \cup [1.78, \infty)$

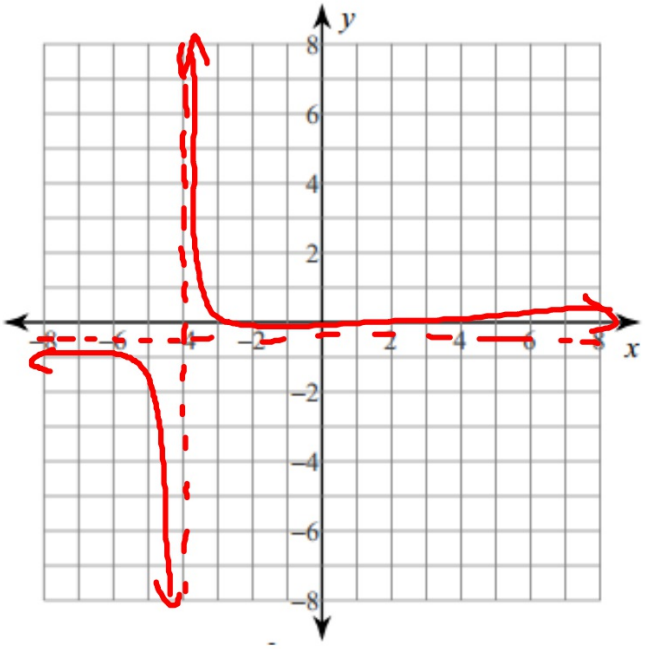
Holes: n/a (nothing cancelled)

VA: $x = 0, 3$ $x(x-3) = 0$

HA: $y = 0$ $x = 0$ $x - 3 =$

degree $\frac{0}{2}$ $\frac{L}{H}$

$$f(x) = \frac{x-4}{-4x-16}$$



Domain: $(-\infty,-4)\cup(-4,\infty)$

Range: $(-\infty,-\frac{1}{4})\cup(-\frac{1}{4},\infty)$

Holes: none

VA: $x=-4$

HA: $y=\frac{1}{-4}$