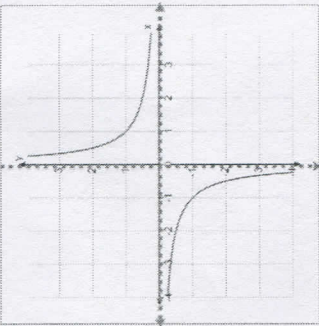


OBJECTIVE 1: Parent Function

- Restricting the domain
- Vertical asymptotes
- Horizontal asymptotes
- Creating t-charts
- Using the calculator for graph and table
- "h" & "k" as translations



Translations of Rational Functions

$$y = \frac{a}{x-h} + k$$

asymptotes

$y = k$

$x = h$

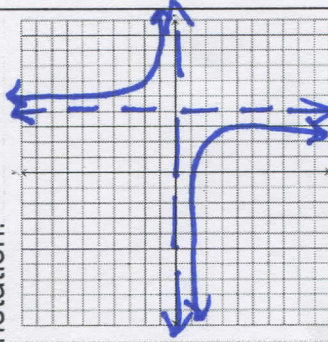
STEPS:

1. "h" moves the graph right or left
2. "k" moves the graph up or down
3. Vertical asymptote moves from $x = 0$, moves with "h"
4. Horizontal asymptote moves from $y = 0$, moves with "k"
5. Restrict the domain

TASK 1: Sketch the following by translating the parent function, the state the VA and HA. Finally state the domain restriction in interval notation.

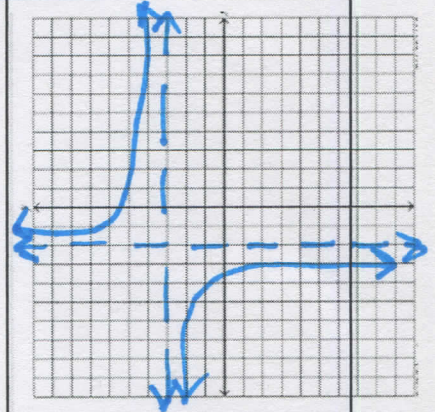
a) $y = \frac{1}{x-4}$ → 4u

h = 4
 k = 0
 VA: $x = 4$
 HA: $y = 0$
 D: $(-\infty, 4) \cup (4, \infty)$



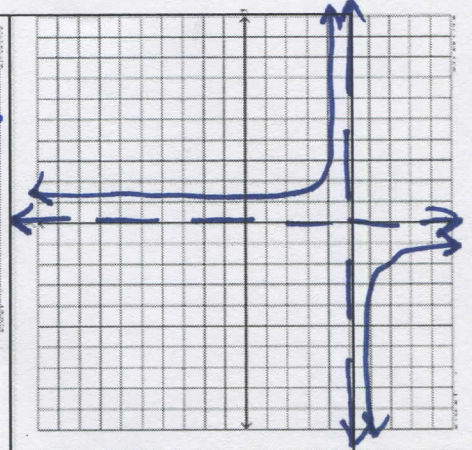
b) $y = \frac{1}{x+2} + 3$ ← 2u, ↑ 3u

h = -2
 k = 3
 VA: $x = -2$
 HA: $y = 3$
 D: $(-\infty, -2) \cup (-2, \infty)$



c) $y = \frac{1}{x} - 5$ ↓ 5u

h = 0
 k = -5
 VA: $x = 0$
 HA: $y = -5$
 D: $(-\infty, 0) \cup (0, \infty)$

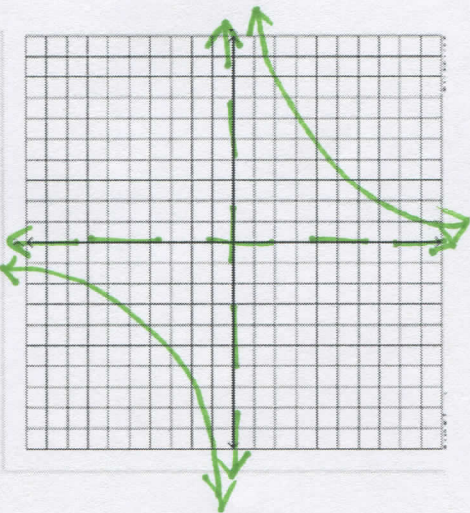


TASK 2: Graph and compare the function and its parent function. State the transformations from the parent function.

a) $g(x) = \frac{-6}{x}$ Parent: $f(x) = \frac{1}{x}$

$= -6(\frac{1}{x})$

VS 6
R-x



TASK 3: State the transformations and the domain and range in interval notation.

Think about the transformations and the asymptotes to understand domain and range. Or graph it on your calculator to see where the error is on your table.

a) $y = \frac{3}{x} - 2$

VSZ
↓Zu

D: $(-\infty, 0) \cup (0, \infty)$
R: $(-\infty, -2) \cup (-2, \infty)$

h=0
k=-2

b) $y = \frac{-1}{x+4}$

Rx
←4u

D: $(-\infty, -4) \cup (-4, \infty)$
R: $(-\infty, 0) \cup (0, \infty)$

h=-4
k=0

c) $y = \frac{1}{x-1} + 5$

→1u
↑5u

D: $(-\infty, 1) \cup (1, \infty)$
R: $(-\infty, 5) \cup (5, \infty)$

h=1
k=5

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

Rx
VSZ
→1u
↑3u

D: $(-\infty, 1) \cup (1, \infty)$
R: $(-\infty, 3) \cup (3, \infty)$

h=1
k=3

Common mistakes:

Still need help with: