

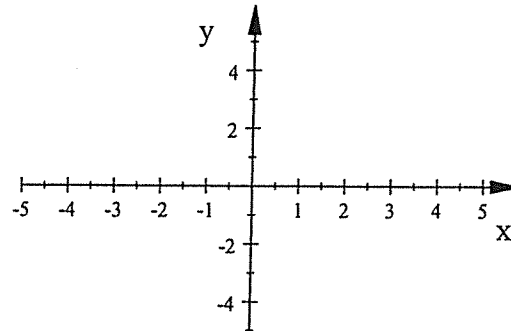
Sec 9-2: Graphs of the Reciprocal Function Exploration

1. What is the general form of the Reciprocal Family of functions:

2. a) Graph the Parent Reciprocal Function: $Y_1 = \frac{1}{x}$ using the following window:

$$X_{\min} = -5 \quad X_{\max} = 5 \quad Y_{\min} = -5 \quad Y_{\max} = 5$$

Sketch what you see on the graph at the right:



b) The graph has two parts. Explain why there is a break in the graph when $x = 0$.

c) $x = 0$ is called a Vertical Asymptote (VA).

i. Describe what the graph does as you get closer to the VA from the left side.

ii. Describe what the graph does as you get closer to the VA from the right side.

3. a) What is each part of the graph called?

b) Where are these two parts of the graph located?

4. What is the equation of the Horizontal Asymptote?

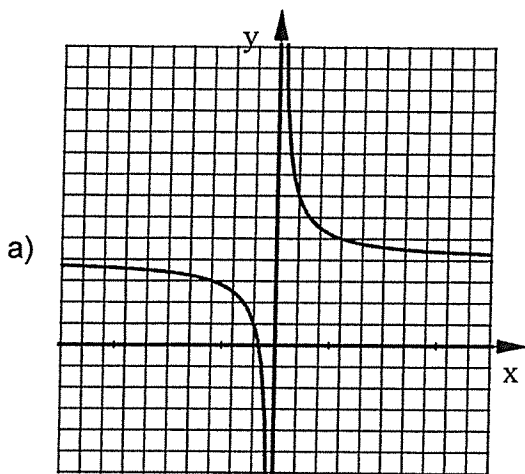
5. Keep $Y_1 = \frac{1}{x}$. Now graph $Y_2 = \frac{a}{x}$ trying different values of a , but keeping it positive. Explain what changing the value of a does to the graph.

6. Keep $Y_1 = \frac{1}{x}$. Now graph $Y_2 = \frac{a}{x}$ using a negative value of a . What happens to the graph when a is negative?

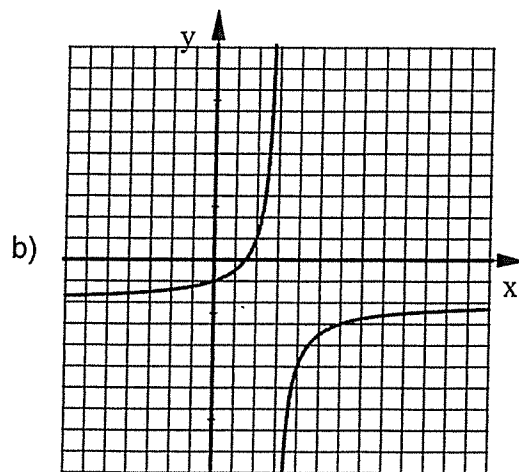
7. Keep $Y_1 = \frac{1}{x}$ but graph using a Standard Window. Now graph $Y_2 = \frac{1}{x-h}$, trying different values of h , both positive and negative. Explain what changing the value of h does to the graph.

8. Keep $Y_1 = \frac{1}{x}$ with a Standard Window. Now graph $Y_2 = \frac{1}{x} + k$, trying different values of k , both positive and negative. Explain what changing the value of k does to the graph.

9. Each graph below is a transformation of $y = \frac{3}{x}$, write the equation of each assuming $|a| = 3$ for all graphs.



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