Robert Colson’s

Lesson 4.1: **Inverse Variation and the Reciprocal Function**

|  |  |
| --- | --- |
| Objectives | * Use inverse variation to write and graph reciprocal functions. * Identify the effect of transformations on the graph of the parent reciprocal function and define the effects of h and k on the function f(x) =1/(x-h) + k.. |
| Language Objective | * Students will write their own definition of key vocabulary. * Students will do a 3 reads on pg. 2 * Students will complete sentence frames with a word bank on pg. 8 |
| Essential Understanding | A reciprocal function is used to model inverse variation, which is a proportional relationship between two variables such that when one variable increases, the other decreases. |

**define the following Vocabulary:  
  
Asymptote:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
  
  
  
Constant of Variation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Inverse variation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
  
  
reciprocal function:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **A white background with black text  Description automatically generated** | **First Read - Understanding the Context** |  |
| *What is the core of the problem?*   * I think this problem is about... * This problem is about... * In this problem, I think that...is happening. * I agree with you that... * I disagree because... |  |
| **Second Read - Interpreting the Question** |  |
| *What are we trying to find out?*   * The question is... * I know the problem is asking...because... |  |
| **Third Read - Identifying Information** |  |
| *What are the important quantities, relationships, and other relevant information?*   * The quantities are... * I can count... * I notice the quantities are... * These quantities help me to answer... * The information from the situation that we need is... |  |
|  | |

**A close-up of a text

Description automatically generated**

**A grid of numbers

AI-generated content may be incorrect.**

****

****

**A number grid with black numbers

AI-generated content may be incorrect.**

****

**A black text on a white background

Description automatically generated**

**A white rectangular grid with black numbers

AI-generated content may be incorrect.**

**A number grid with numbers

AI-generated content may be incorrect.**

**‘A black text on a white background

Description automatically generated**

****

****

**A black text on a white background

Description automatically generated**

****

**A stringed instrument with text and symbols

Description automatically generated**

**A black text on a white background

Description automatically generated**

****

**A black text on a white background

Description automatically generated**

****

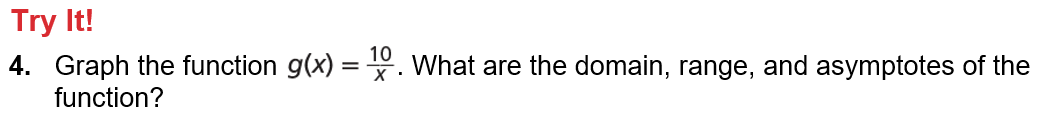
**A yellow and black text

AI-generated content may be incorrect.A grid of blue squares

Description automatically generated**

****

|  |  |
| --- | --- |
| **Fill in the following sentences with terms from the word bank ->>** | **Word Bank** |
| **The graph of f has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ asymptote y = 0.**  **An \_\_\_\_\_\_\_\_\_\_\_\_ is a line that a graph approaches.**  **For x-values close to 0:**  **- As x approaches 0 from \_\_\_\_\_\_\_\_\_\_\_\_\_\_ values, f(x) goes to ∞**  **- As x approaches 0 from \_\_\_\_\_\_\_\_\_\_\_\_\_\_ values, f(x) goes to -∞**  **The graph of f has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ asymptote x = 0.**  **The domain of f(x) = 1/x is { \_\_\_\_\_\_\_\_\_\_ | x ≠ 0}.**  **The range is {y | y \_\_\_\_\_\_\_\_\_\_\_ 0}.**  **The end behavior is f(x) → \_\_\_\_\_\_\_\_\_\_ as x → ±∞.** | **Vertical** |
| **≠** |
| **x** |
| **Negative** |
| **0** |
| **Horizontal** |
| **Positive** |
| **asymptote** |

**A grid of blue squares

Description automatically generated**

**A white background with black text

Description automatically generated  
A grid of blue squares

Description automatically generated**

**  
Sketch g(x), and then check with DESMOS.com.  
  
A grid of blue squares

Description automatically generated**

**A black text on a white background

Description automatically generated**

**A grid of blue squares

Description automatically generated**

**Practice & Problem Solving**

|  |  |
| --- | --- |
| **Ex 1,2,3**  **A text on a white background  Description automatically generated** | **Ex 3** |
| **Ex 4** | **Ex 4** |
| **Ex 4** |  |
| **Ex 5**  **A white background with black text  Description automatically generated** | **Ex 5** |
| **Ex 5**  **A math problem with black lines and white text  Description automatically generated** | **Ex 5** |

**A screenshot of a graph

Description automatically generated**