Robert Colson’s

Lesson 4.2: **Graphing Rational Functions**

|  |  |
| --- | --- |
| Objectives | * Graph rational functions by identifying asymptotes and end behavior. * Rewrite simple rational expressions in different forms using long division. |
| 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 rational function is any function *R*(*x*) =  where *P*(*x*) and *Q*(*x*) are polynomial functions. The domain of a rational function is all real numbers except any *x*-values for which *Q*(*x*) equals to zero. The graph of a rational function has one or more asymptotes, which guide the end behavior of the graph. |

**define the Vocabulary:  
  
Rational Expression:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
  
Rational Function:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
|  | **First Read - Understanding the Context** |  |
| *What is the core of the problem?*   * I think this problem is about... |  |
| **Second Read - Interpreting the Question** |  |
| *What are we trying to find out?*   * 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... * These quantities help me to answer... * The information from the situation that we need is... |  |
| Solution (show and explain your answer) | |
|  | |
| Interpretation of solution (interpret your solution in your own words) | |
|  | |

**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**

****

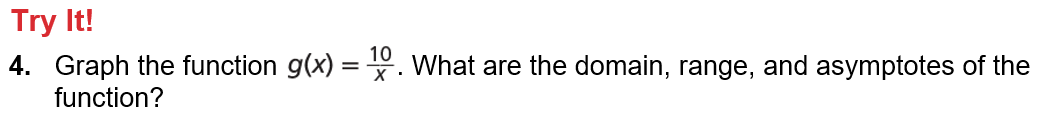
**A yellow and black text

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**  **A math problem with black text  Description automatically generated with medium confidence** |
| **Ex 4**  **A white background with black text  Description automatically generated** | **Ex 4**  **A math problem with black text  Description automatically generated with medium confidence** |
| **Ex 4 A screenshot of a test  Description automatically generated** |  |
| **Ex 5**  **A white background with black text  Description automatically generated** | **Ex 5**  **A math problem with black text  Description automatically generated with medium confidence** |
| **Ex 5**  **A math problem with black lines and white text  Description automatically generated** | **Ex 5**  **A math problem with black text  Description automatically generated** |

**A screenshot of a graph

Description automatically generated**