Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Behavior of rational functions 9-7-17 hour 1 2 3 4 5 6 7

1. Explain why each of the following rational functions does not have a vertical asymptote
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Explain why each of the following rational functions does not have a horizontal asymptote
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Explain why each of the following rational functions does not have an x intercept
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Which of the following rational functions does not have horizontal asymptote of y = 0? Explain why not
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. State the x and y intercepts of each of the rational functions if possible

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) |
| Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) | Y intercept (0, )  X intercept(s) |

1. State the Vertical and Horizontal Asymptotes of each of the rational functions if possible

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote |
| Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote | Vertical asymptotes  Horizontal Asymptote |

1. Explain why a rational function would have a HOLE
2. Explain how to find a HOLE if a rational function has a HOLE
3. Each of the following rational functions has a HOLE, find its location
   1.  has a hole at ( , )
   2.  has a hole at ( , )
   3.  has a hole at ( , ) and at ( , )
4. Use Synthetic or Long Division rewrite each rational function
   1. 
   2. 

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Rational Functions and their parts 9-7-17 Hour 1 2 3 4 5 6 7

Use the Provided Graphs and Functions to complete this table SHOW YOUR WORK FOR Lines 2, 4, 6, and 12

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Point A | ( , ) | Line 1 |  | Work for line 2 |
| Point B | ( , ) | Line 2  (hint use synthetic division) |  |
| Point C | ( , ) | Line 3 |  |
| Point D | ( , ) | Line 4  (hint use synthetic division)  (note missing term!) |  | Work for line 4 |
| Point E | ( , ) | Line 5 |  |
| Point F | ( , ) | Line 6  (hint use long division)  (note missing term!) |  |
| Point G | ( , ) | Line 7 |  | Work for line 6 |
| Point H | ( , ) | Line 8 |  |
| Point I | ( , ) | Line 9 |  |
| Point J | ( , ) | Line 10 |  |
| Point K | ( , ) | Line 11 |  | Work for line 12 |
| Point L | ( , ) | Line 12  (hint use synthetic division) |  |
| Point M | ( , ) | Line 13 |  |
| Point N | ( , ) |
| Point O | ( , ) |
| Point P | ( , ) |
| Point Q | ( , ) |
| Point R | ( , ) |
| Point S | ( , ) |
| Point T | ( , ) |