Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Desmos – Polygraph Project**

**Graphing Rational Functions**

**(student.desmos.com)**

**Goals of the Activity:**

Students will be able to:

* Identify important features of rational functions
* Precisely describe these features to their peers
* Increase their relevant vocabulary

**My Mystery Function:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s): | vertical asymptote: | domain: | hole(s): |
| y-intercept: | horizontal asymptote: | range: | My Mystery Function: |

**Grading Rubric:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **6 Points** | **4 Points** | **2 Point** | **0 Points** |
| **Class Notes** | Complete | Missing some | Missing most | Incomplete |
| **Vocabulary** | 3 words | 2 words | 1 word | 0 words |
| **Questioning** | 0 mistakes | 1 mistake | 2 mistakes | 3+ mistakes |
| **Answering** | 0 mistakes | 1 mistake | 2 mistakes | 3+ mistakes |
| **Mystery Function** | 0 mistakes | 1 mistake | 2 mistakes | 3+ mistakes |

**Graphing Rational Functions - Vocabulary**

**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

 **EXAMPLE #1:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #2:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #3:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #4:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #5:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #6:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #7:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**EXAMPLE #8:**



**X-INTERCEPT(S):**

**Y-INTERCEPT:**

**VERTICAL ASYMPTOTE(S):**

**HORIZONTAL ASYMPTOTE(S):**

**HOLE(S):**

**DOMAIN:**

**RANGE:**

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-.5, 0) and (1, 0) | vertical asymptote:x = -2 and x = 4 | domain:x ≠ -2, 4 | hole(s):none |
| y-intercept:(0, -0.125) | horizontal asymptote:y = -2 | range:y ≠ -2 |   |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-1.5,0) and (1,0) | vertical asymptote:x = 4 and x = -2 | domain:x ≠ 4, -2 | hole(s):none |
| y-intercept:(0, 0.375) | horizontal asymptote:y = 2 | range:y≠2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-2,0) and (0.5, 0) | vertical asymptote:x = 1 and x = -3 | domain:x ≠ -3, 1 | hole(s):none |
| y-intercept:(0,0.666) | horizontal asymptote:y = 2 | range:y≠2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(3, 0) and (-0.666, 0) | vertical asymptote:x = 4 and x = -1 | domain:x ≠ -1, 4 | hole(s):none |
| y-intercept:(0, 1.5) | horizontal asymptote:y = 3 | range:y≠3 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-2.6, 0) | vertical asymptote:x = -3 | domain:x ≠ -3 | hole(s):none |
| y-intercept:(0, 4.333) | horizontal asymptote:y = 5 | range:y ≠ 5 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(8,0) | vertical asymptote:x = 5 | domain:x ≠ -5 | hole(s):none |
| y-intercept:(0, -1.6) | horizontal asymptote:y = -1 | range:y ≠ -1 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-.333, 0) | vertical asymptote:x = -2 | domain:x ≠ -2 | hole(s):none |
| y-intercept:(0, 0.5) | horizontal asymptote:y = 3 | range:y ≠ 3 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(3, 0) | vertical asymptote:x = 1 | domain:x ≠ 1 | hole(s):none |
| y-intercept:(0, -6) | horizontal asymptote:y = -2 | range:y ≠ -2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(0.333, 0) | vertical asymptote:x = -3 | domain:x ≠ -3 | hole(s):none |
| y-intercept:(0, -0.333) | horizontal asymptote:y = 3 | range:y ≠ 3 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-1.333, 0) | vertical asymptote:x = -2 | domain:x ≠ -2 | hole(s):none |
| y-intercept:(0, 2) | horizontal asymptote:y = -2 | range:y ≠ -2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-1.25, 0) | vertical asymptote:x = -3/2 | domain:x ≠ -3/2 | hole(s):none |
| y-intercept:(0, -1.666) | horizontal asymptote:y = -2 | range:y ≠ -2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(2.5, 0) | vertical asymptote:x = -5/3 | domain:x ≠ -5/3 | hole(s):none |
| y-intercept:(0, -1) | horizontal asymptote:y = 2/3 | range:y ≠ -2/3 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-3, 0) | vertical asymptote:x = -1 | domain:x ≠ -1, 2 | hole(s):(2, 5/3) |
| y-intercept:(0, 3) | horizontal asymptote:y = 1 | range:y ≠ 1, 5/3 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-1, 0) | vertical asymptote:x = 2 | domain:x ≠ 2, 3 | hole(s):(3, 4) |
| y-intercept:(0, -0.5) | horizontal asymptote:y = 1 | range:y ≠ 1, 4 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(-1, 0) | vertical asymptote:x = 2 | domain:x ≠ 2, 5 | hole(s):(5, 2) |
| y-intercept:(0, -0.5) | horizontal asymptote:y = 1 | range:y ≠ 1, 2 |  |

**MY MYSTERY FUNCTION:**

|  |  |  |  |
| --- | --- | --- | --- |
| x-intercept(s):(3, 0) | vertical asymptote:x = -4 | domain:x ≠ -4, -2 | hole(s):(-2, -5/2) |
| y-intercept:(0, -0.75) | horizontal asymptote:y = 1 | range:y ≠ 1, -5/2 |  |