

Investigating Oblique/Slant Asymptotes and Holes

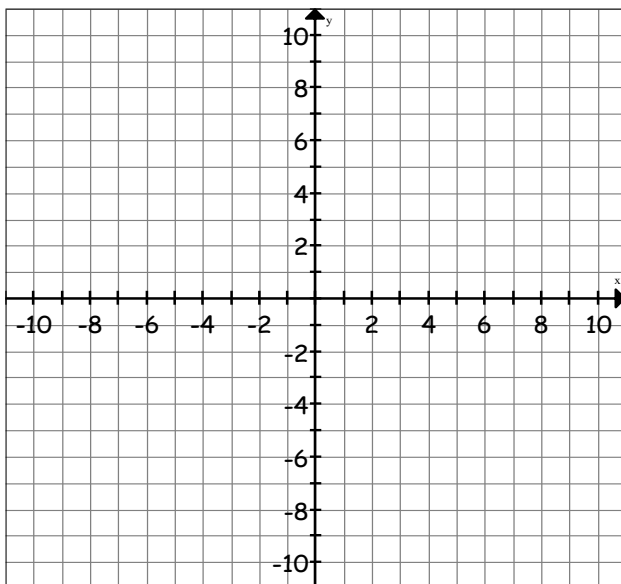
Name _____

Date _____ Block _____

1. $f(x) = \frac{2x^2 - 4x}{x+1}$

- a. What are the equations of the horizontal and vertical asymptotes of the graph of this function?
- b. What are the zeros/x-intercepts of the graph?
- c. What is the y-intercept of the graph?
- d. Graph the function on a graphing calculator and explore the table of values. Does anything about the graph appear unusual compared to the graphs of other rational functions you have seen?

e. Graph the function on the grid below.

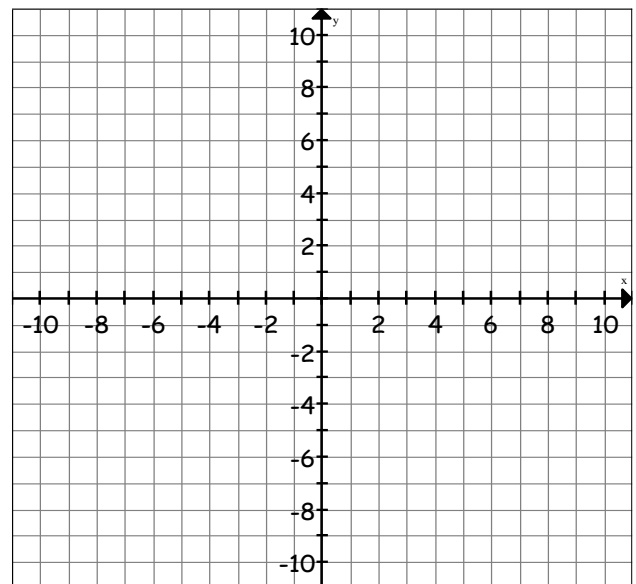


f. What are the domain and range of the function?

2. $f(x) = \frac{(x+3)(x^2 + 3x - 10)}{x-2}$

- a. What are the equations of the horizontal and vertical asymptotes of the graph of this function?
- b. What are the zeros/x-intercepts of the graph?
- c. What is the y-intercept of the graph?
- d. Graph the function on a graphing calculator and explore the table of values. Does anything about the graph appear unusual compared to the graphs of other rational functions you have seen?

e. Graph the function on the grid below.



f. What are the domain and range of the function?

Graphs of Rational Functions: Oblique/Slant Asymptotes and Holes

Find all vertical and slant asymptotes of the graph of each of the following.

1. $f(x) = \frac{x^2}{x-1}$

2. $f(x) = \frac{x^2+1}{x}$

3. $f(x) = \frac{x^2+x-1}{x-1}$

4. $f(x) = \frac{2x^2-5}{x+3}$

5. $f(x) = \frac{x^3}{x^2-4}$

6. $f(x) = \frac{9-x^2}{2+x}$

State the coordinates of all holes in the graph of each of the following rational functions.

7. $f(x) = \frac{x-3}{3-x}$

8. $f(x) = \frac{x+5}{x+5}$

9. $f(x) = \frac{2x+6}{x+3}$

10. $f(x) = \frac{x^2-4}{x+2}$

11. $f(x) = \frac{x^2-3x-10}{x+2}$

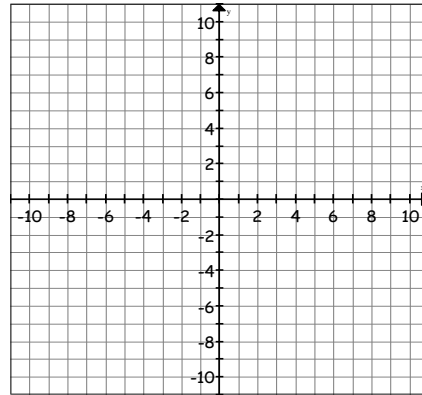
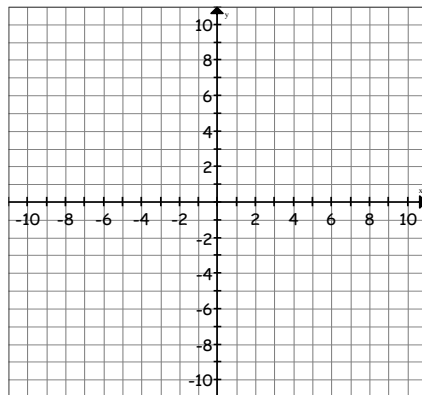
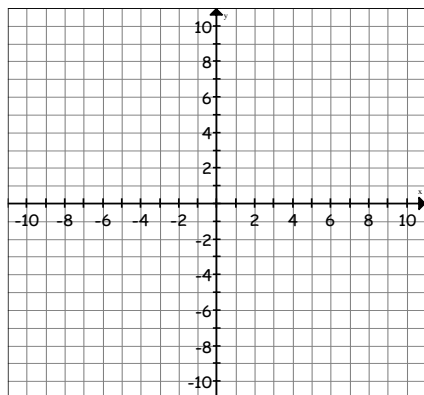
12. $f(x) = \frac{x^3+x^2-x-1}{x+1}$

Graph each rational function and find the following, as applicable, for each function: y-intercept, zeros, equations of all vertical, horizontal, and slant asymptotes, coordinates of holes, and the domain and range.

13. $f(x) = \frac{x^2-2x-3}{x+2}$

14. $f(x) = \frac{x^2-4}{x+2}$

15. $e(x) = \frac{x^2-x}{x+2}$



y-intercept: _____

zeros: _____

asymptotes: _____

holes: _____

domain: _____

range: _____

y-intercept: _____

zeros: _____

asymptotes: _____

holes: _____

domain: _____

range: _____

y-intercept: _____

zeros: _____

asymptotes: _____

holes: _____

domain: _____

range: _____