Math 1324 Date: _____

3.6 Rational Functions

1. A _____ is a function whose rule is the quotient of two polynomials, such as

2. _____ have both numerator and denominators with first-degree or constant polynomials.

3. **Characteristics of a Rational Function**:
   a. Parent function: _____.
   b. The graph is called a _____.
   c. _____ describes the behavior of a graph as x or y approaches infinity. There are two types of asymptotes _____ and _____.
      - The _____ has an equation that starts with x = since this is a vertical line.
      - The _____has an equation y = since this is a horizontal line

   d. To find the vertical asymptotes _____.

   e. In order to determine the **horizontal asymptote** we need to look at the n and m.
      - If _____then the equation of the horizontal asymptote is _____.
      - If _____then the equation of the horizontal asymptote is _____.
      - If _____then there is no horizontal asymptote. There is an oblique asymptote: You find the oblique asymptotes by using long division.

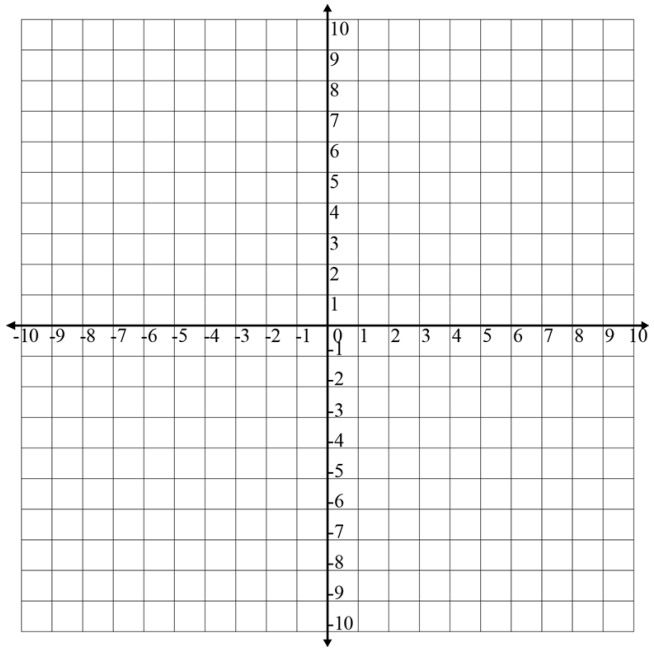
   f. To find the _____, set the numerator _____.

   g. To find the _____, replace _____ with _____ then simplify.

4. **Graphing a Rational Function**
   a. Factor both the _____ and _____.
   b. Find the _____.
   c. Find the _____.
   d. Find the _____.
   e. Find the _____.
   f. Graph the asymptotes using dashed lines
   g. Plot the x- and y-intercepts.
   h. Find two other points on the line using your graphing calculator or make a table.

Class Examples:

1. Graph $f(x) = \frac{3x+2}{2x+4}$

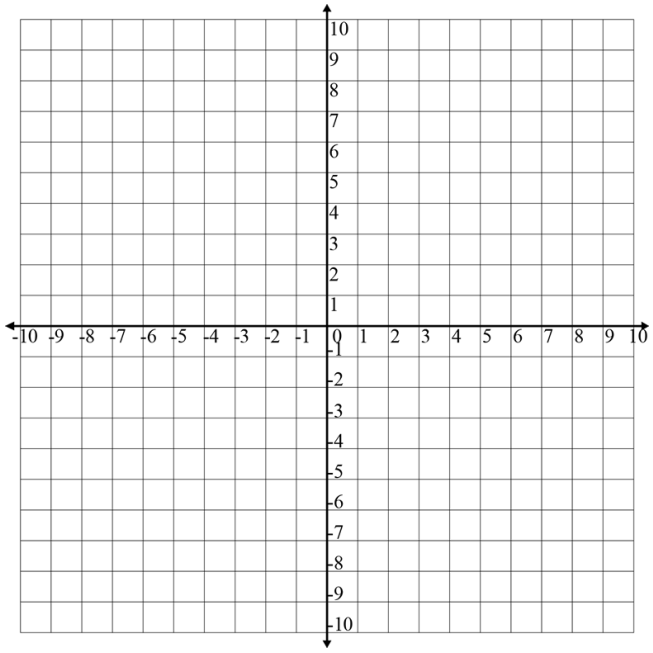


   a. Vertical Asymptote: _____

   b. Horizontal Asymptote: _____
   c. X-intercept: _____

   d. Y-intercept: _____
   e. Table:

2. Graph: $f(x) = \frac{2x^2}{x^2-4}$



   a. Vertical Asymptote: _____

   b. Horizontal Asymptote: _____
   c. X-intercept: _____

   d. Y-intercept: _____
   e. Table: