Rational Functions

Answer the questions for each of the following using the graph of each of the functions.

1. Graph the function $f(x) = \dfrac{1}{x-4}$

    A) What is the value of the function as x approaches 4 from the right?
    B) What is the value of the function as x approaches 4 from the left?
    C) What is the value of the function when x is 4?
    D) What is the value of the function as x approaches infinity?
    E) What is the value of the function as x approaches negative infinity?

2. Graph the function $f(x) = -\dfrac{1}{x+2}$

    A) What is the value of the function as x approaches -2 from the right?
    B) What is the value of the function as x approaches -2 from the left?
    C) What is the value of the function when x is -2?
    D) What is the value of the function as x approaches infinity?
    E) What is the value of the function as x approaches negative infinity?

3. Graph the function $f(x) = \dfrac{x-3}{x+2}$

    A) What is the value of the function as x approaches -2 from the right?
    B) What is the value of the function as x approaches -2 from the left?
    C) What is the value of the function when x is -2?
    D) What is the value of the function as x approaches infinity?
    E) What is the value of the function as x approaches negative infinity?

4. Graph the function $f(x) = \dfrac{2x^2}{x^2-4}$

    A) What is the value of the function as x approaches -2 from the right?
    B) What is the value of the function as x approaches -2 from the left?
    C) What is the value of the function when x is -2?
    D) What is the value of the function as x approaches 2 from the left?
    E) What is the value of the function as x approaches 3 from the right?
    F) What is the value of the function when x is 2?
    G) What is the value of the function as x approaches infinity?
    H) What is the value of the function as x approaches negative infinity?

5. Graph the function $f(x) = \dfrac{x}{x^2 + 1}$

    A) What is the value of the function as x approaches infinity?
    B) What is the value of the function as x approaches negative infinity?

6. Graph the function $f(x) = \dfrac{4x^2}{3x^2 - 1}$

    A) What is the value of the function as x approaches infinity?
    B) What is the value of the function as x approaches negative infinity?

7. Graph the function $f(x) = \dfrac{2x}{\sqrt{3x^2 + 1}}$

    A) What is the value of the function as x approaches infinity?
    B) What is the value of the function as x approaches negative infinity?

8. Graph the function $f(x) = \dfrac{x^2 + 2x - 15}{x - 1}$

    A) What is the value of the function as x approaches 1 from the right?
    B) What is the value of the function as x approaches 1 from the left?
    C) What is the value of the function when x is 1?
    D) What is the value of the function as x approaches infinity?
    E) What is the value of the function as x approaches negative infinity?

9. Graph the function $f(x) = \dfrac{2x^2 - 11x + 12}{x - 4}$

    A) What is the value of the function as x approaches 4 from the right?
    B) What is the value of the function as x approaches 4 from the left?
    C) What is the value of the function when x is 4?
    D) What is the value of the function as x approaches infinity?
    E) What is the value of the function as x approaches negative infinity?