**Sketch the graph of f. Label the vertical and horizontal asymptotes.**

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

  

4. f(x) = $\frac{(x-2)}{(x^{2}-x-6)}$ 5. f(x) = $\frac{(x-3)}{(x^{2}-1)}$ 6. f(x) = $\frac{-3x^{2}-3x+6}{x^{2}-9}$

  

**Simplify f(x), and sketch the graph of f.**

7. f(x) = $\frac{2x^{2}+x-6}{x^{2}+3x+2}$ 8. f(x) = $\frac{x-1}{1-x^{2}}$ 9. f(x) = $\frac{x^{2}+x-2}{x+2}$

  

**Find an equation of a rational function f that satisfies the given conditions.**

10. vertical asymptote: x=4 11. vertical asymptotes: x = -2, x = 0

 horizontal asymptote: y = -1 horizontal asymptote: y = 0

 x-intercept: 3 x-intercept: 2; f(3) = 1

12. vertical asymptotes: x = -3, x = 1

 horizontal asymptote: y = 0

 x-intercept: -1; f(0)= -2

 hole at x = 2

13. (a) A student has finished 48 credit hours with a GPA of 2.75. How many additional credit hours y at 4.0 will raise the student's GPA to some desired value x? (Determine y as a function of x.)

 (b) Create a table of values for x and y, starting with x=2.8 and using increments of 0.2.

 (c) Graph the function in part (a) in the viewing rectangle [2,4] by [0,1000,100].

 (d) What is the vertical asymptote of the graph in part (c)?

 (e) Explain the practical significance of the value x = 4.