College Algebra Worksheet (8)

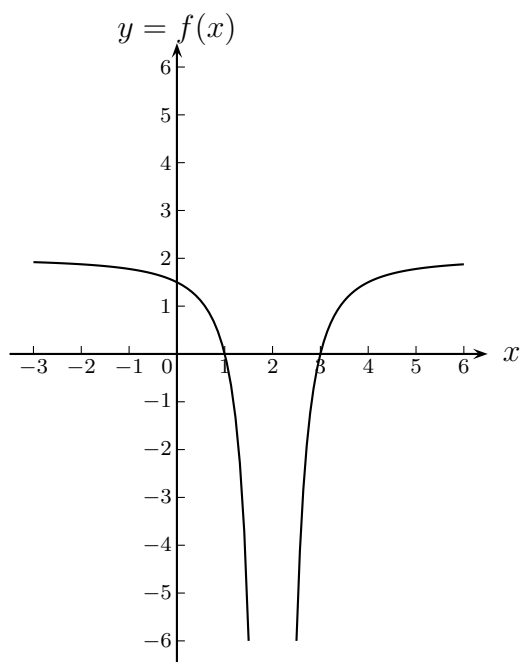**Multiple Choice Questions on Rational Functions / Answers in Red**

1. Find the function f whose graph is given below.

    a. $f(x) = \dfrac{(x-1)(x-3)}{(x-2)^2}$

    b. $f(x) = \dfrac{2(x-1)(x-3)}{(x-2)}$

    c. $f(x) = \dfrac{2(x-1)(x-3)}{(x-2)^3}$

    d. $f(x) = \dfrac{2(x-1)(x-3)}{(x-2)^2}$

2. If function f is defined by $f(x) = \dfrac{4x^2 - 12x}{x^2 - 9}$, then at $x = 3$

    a. the graph of f has a vertical asymptote.

    b. the graph of f has a hole on the x axis.

    c. $f(x) = 0$

    d. the graph of f has a hole at $(3, 2)$.

3. Which of the following functions has an oblique asymptote?

    a. $f(x) = \dfrac{x^5 + 1}{x^4 + 3x^2 + 2}$

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

    c. $f(x) = \dfrac{4x^2 + x + 1}{x^2}$

    d. $f(x) = \dfrac{x^5}{x^2 - 1}$

4. Find the equation of the oblique asymptote of the function $f(x) = \dfrac{x^2 - 11x + 30}{x - 4}$

    a. $y = x - 4$

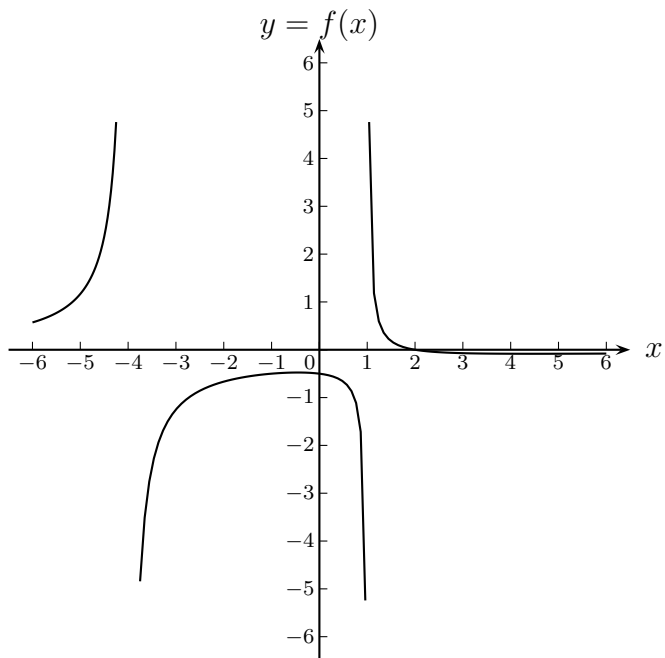   b. $y = x + 4$

    c. $y = x - 7$

    d. $y = x + 7$

5. Find the function f whose graph is given below.

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

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

c. $f(x) = \dfrac{x-2}{x^2-3x-4}$

d. $f(x) = \dfrac{2-x}{x^2-3x-4}$

6. Which of the following functions has no horizontal asymptote?

a. $f(x) = \dfrac{x^2-2}{x^3-9x-4}$

b. $f(x) = \dfrac{5x^4-2^3-x+7}{-x^3+3x^2-4}$

c. $f(x) = \dfrac{9x^2-2x-3}{x^2+8x-2}$

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

7. Which of the following functions has a hole at (1,4)?

    a. $f(x) = \dfrac{x-1}{(x-1)(x-5)}$

    b. $f(x) = \dfrac{x-1}{(x+1)^2}$

    c. $f(x) = \dfrac{4}{x-1}$

    d. $f(x) = \dfrac{(x-1)(11x+1)}{(x-1)(x+2)}$

8. Which of the following functions has a zero, a vertical asymptote and a horizontal asymptote?

    a. $f(x) = \dfrac{x-4}{(x-4)(x-5)}$

    b. $f(x) = \dfrac{(x+2)(x^2+1)}{(x-4)(x^2+7)}$

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

    d. $f(x) = \dfrac{(x-5)(x^2+8)}{(x-4)}$

9. Which of these functions has no vertical asymptotes?

    a. $f(x) = \dfrac{x-7}{(x-7)(x-5)}$

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

    c. $f(x) = \dfrac{1}{x-2}$

    d. $f(x) = \dfrac{x^2-9x+20}{(x-4)(x-5)}$

10. Which of the following functions has a hole, one zero, an oblique asymptote and no vertical asymptote?

    a. $f(x) = \dfrac{(x-7)(x^2+1)}{(x-7)(x-5)}$

    b. $f(x) = \dfrac{(x-7)(x^2-1)}{(x-7)(x-2)}$

    c. $f(x) = \dfrac{(x-7)(x^3-4)}{(x-7)(x^2+5)}$

    d. $f(x) = \dfrac{x-7}{(x-7)(x-5)}$