APPC Lesson 2.6 Homework

Name _____

1. Write the equations for the vertical asymptotes of the graph of $f(x) = \dfrac{3}{(x+4)(x-10)}$.

2. For a rational function m, $\lim\limits_{x \to -9^-} m(x) = 2$ and $\lim\limits_{x \to -9^+} m(x) = 2$ but $m(-9)$ is undefined. Does the graph of m have a hole, a vertical asymptote, or neither at $x = -9$? Explain.

3. Let $f(x) = \dfrac{(x-9)(x+2)}{(x+2)(x+4)}$. Where does the graph of f have a vertical asymptote?

4. Find the domain of $g(x) = \dfrac{x^2 - 16}{x^2 + x - 12}$

5. Let $f(x)=\dfrac{(x-a)(x-b)}{(x-b)(x-c)}$ for some constants a, b, and c where $a \neq b \neq c$.
Which of the following statements is FALSE?

A) The graph of f has exactly one x -intercept at $x=a$.

B) The domain of f is $\{x \in \mathbb{R} | x \neq b, c\}$.

C) The graph of f has a vertical asymptote at $x=b$ and a hole at $x=c$.

D) The graph of f has a horizontal asymptote at $y=1$.

6. Let $f(x)=\dfrac{x^2-7x+10}{x^2-3x-40}$.

a. Find the x -intercept(s) of the graph of f.

b. Write the equation(s) of any vertical asymptote(s) on the graph of f.

c. Find the y -intercept of the graph of f.

d. Find the ordered pair(s) of any holes on the graph of f.

e. Write the equation of any horizontal asymptotes of f or explain why none exist.

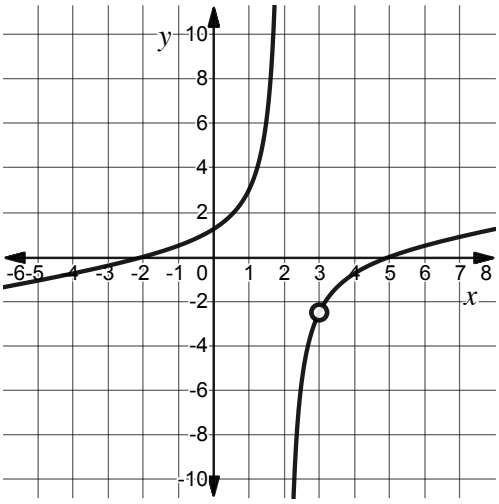
7. Compare the functions $f(x) = \dfrac{(x+1)(x+5)}{x+1}$ and $g(x) = x + 5$.

a. Are the domains the same?

b. Which of the functions, if any, has a vertical asymptote?

c. Use a calculator to graph both functions. What is the same? What is different?

8. The graph of a function f is shown. Which of the following could define the function f?



A)

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

B)

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

C)

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

D)

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