Name_____FA Rational Functions Basic Vocabulary Period_____

Asymptotes (Mark all that apply)

1. _____ Which type(s) of rational function have a horizontal asymptote?
   a. Any rational function that has a numerator whose degree is smaller than its denominator's degree
   b. Any rational function that has a numerator whose degree is greater than its denominator's degree
   c. Any rational function whose numerator's degree is equal to its denominator's degree
   d. none of these

2. _____ What causes a vertical asymptote?
   a. The roots of the numerator
   b. The roots of the denominator
   c. The x intercepts of the rational function
   d. The y intercept of the rational function
   e. The lead coefficients of the numerator and denominator
   f. The x axis
   g. None of these

3. _____ What causes a horizontal asymptote?
   a. The roots of the numerator
   b. The roots of the denominator
   c. The x intercepts of the rational function
   d. The y intercept of the rational function
   e. The lead coefficients of the numerator and denominator
   f. The x axis
   g. None of these

4. _____ Given $f(x) = \frac{2x+4}{3x-6}$, what is the horizontal asymptote?
   a. y = 0
   b. x = 0
   c. x = 2
   d. x = -2
   e. $y = \frac{2}{3}x$
   f. $y = \frac{2}{3}$
   g. $x = \frac{2}{3}$
   h. This rational function does not have a horizontal asymptote
   i. None of these

5. _____ Given $g(x) = \frac{2x^2+4}{3x-6}$, what is the horizontal asymptote?
   a. y = 0
   b. x = 0
   c. x = 2
   d. x = -2
   e. $y = \frac{2}{3}x$
   f. $y = \frac{2}{3}$
   g. $x = \frac{2}{3}$
   h. This rational function does not have a horizontal asymptote
   i. None of these

6. _____ Given $h(x) = \frac{x^2-4}{3x^2-27}$, what is the horizontal asymptote?
   a. y = 0
   b. x = 0
   c. x = 2
   d. x = -2
   e. $y = \frac{1}{3}x$
   f. $y = \frac{1}{3}$
   g. $x = \frac{1}{3}$
   h. This rational function does not have a horizontal asymptote
   i. None of these

7. _____ Given $j(x) = \frac{2x^2-8}{8x^3-1}$, what is the horizontal asymptote?
   a. y = 0
   b. x = 0
   c. x = 2
   d. x = -2
   e. $y = \frac{1}{4}x$
   f. $y = \frac{1}{4}$
   g. $x = \frac{1}{4}$
   h. This rational function does not have a horizontal asymptote
   i. None of these

Asymptotes (Mark all that apply)

8. _____ Given $f(x) = \frac{2x+4}{3x-6}$, what is the vertical asymptote?
   a. y = 0
   b. x = 0
   c. x = 2
   d. x = -2
   e. $y = \frac{2}{3}x$
   f. $y = \frac{2}{3}$
   g. $x = \frac{2}{3}$
   h. This rational function does not have a vertical asymptote
   i. None of these

Intercepts & Asymptotes
Determine the intercepts and asymptotes of each of the rational functions (if NONE, then state so)

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

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

10. $g(x) = \frac{4x+16}{x^2-25}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

11. $h(x) = \frac{4x^2+16x}{x^2-16}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

12. $j(x) = \frac{x^2-8x-9}{3x-6}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

13. $k(x) = \frac{x+1}{x^2-1x-12}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

14. $m(x) = \frac{x^2+3x-10}{2x^2-10x}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

15. $m(x) = \frac{x^2-3x-10}{2x^2-10x}$

X intercept(s) _____

Y intercept _____

Horizontal asymptote _____

Vertical asymptote _____

16. Explain why number 15 has a “hole” in its graph