Name: _____   Date:_____
Unit 1-HW 3   AP Calculus BC

Multiple Choice Questions

1. $\lim\limits_{x\to\infty} \dfrac{3+2x^2-x^4}{3x^4-5} =$

(A) -2 　　　　　 (B) $-\dfrac{1}{3}$ 　　　　　 (C) $\dfrac{1}{5}$ 　　　　　 (D) 1 　　　　　 (E) 3

2. What is $\lim\limits_{x\to -\infty} \dfrac{x^3+x-8}{2x^3+3x-1} =$

(A) $-\dfrac{1}{2}$ 　　　　　 (B) 0 　　　　　 (C) $\dfrac{1}{2}$ 　　　　　 (D) 2 　　　　　 (E) 4

3. Which of the following lines is an asymptote of the graph of $f(x) = \dfrac{x^2+5x+6}{x^2-x-12}$?

I. $x = -3$

II. $x = 4$

III. $y = 1$

(A) II only 　　　　 (B) III only 　　　　 (C) I and III only 　　　 (D) II and III only 　　 (E) I , II and III

4. If the horizontal line $y = 1$ is an asymptote for the graph of the function f, which of the following statements must be true?

(A) $f(0) = 1$

(B) $f(x) = 1$ for all x

(C) $f(1)$ is undefined

(D) $\lim_{x \to 1} f(x) = \infty$

(E) $\lim_{x \to \infty} f(x) = 1$

5. If $x = 1$ is the vertical asymptote and $y = -3$ is the horizontal asymptote for the graph of the function f, which of the following could be the equation of the curve?

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

(B) $f(x) = \dfrac{-3(x-1)}{x+3}$

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

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

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

6. Let $f(x) = \dfrac{3x-1}{x^3-8}$.

    (a) Find the vertical asymptote(s) of f. Show the work that leads to your answer.

    (b) Find the horizontal asymptote(s) of f. Show the work that leads to your answer.

7. Let $f(x) = \dfrac{\sin x}{x^2+2x}$.

    (a) Find the vertical asymptote(s) of f. Show the work that leads to your answer.

    (b) Find the horizontal asymptote(s) of f. Show the work that leads to your answer.

8. If $\lim\limits_{x \to 0} \dfrac{\sqrt{2+ax}-\sqrt{2}}{x} = \sqrt{2}$ what is the value of a?