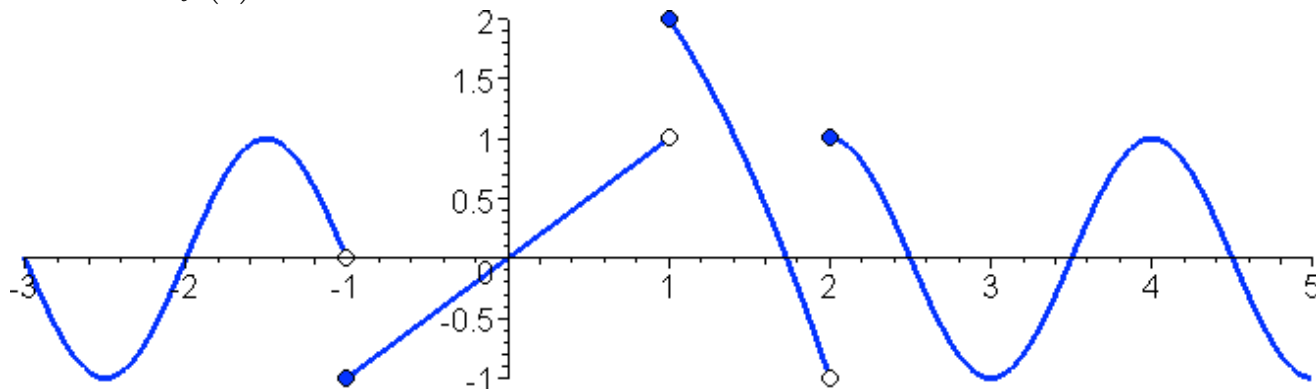Name_____ Date_____ Period_____

PreAP Precalculus
TEST Chapter 2.1-2.3, Form A. No Calculator

Part I: Multiple Choice, Put your **CAPITAL LETTER** answer choice in the blank to the left of the number.

Use the graph of $f(x)$ below for $-3 \le x \le 5$ to answer questions 1- 5.

_____ 1. $\lim\limits_{x \to -1} f(x) =$

(A) -1   (B) 0   (C) 1   (D) 2   (E) DNE

_____ 2. $f(x)$ is monotonic/strictly increasing on which of the following given intervals?

(A) $(-3,-2)$ (B) $(-1,2)$ (C) $(1,2)$ (D) $(3,4)$ (E) $(-2,-1)$

_____ 3. $f(x)$ has a relative/local minimum of

(A) 5   (B) -1 (C) 3   (D) 2   (E) $f(x)$ has no relative/local minimum

_____ 4. $f(x)$ has a relative/local maximum at

(A) 1   (B) -1 (C) 3   (D) -2   (E) $f(x)$ has no relative/local maximum

_____ 5. Which of the following is NOT true about the graph of $f(x)$?

(A) $f(x)$ is continuous at $x = 0$ (B) $\lim\limits_{x \to 2^-} f(x) = f(-1)$ (C) $\lim\limits_{x \to 1} f(x) = DNE$

(D) $f(x)$ has a local max of 2.   (E) $f(x)$ has a local min of -1 at 2.

_____ 6. If $h(x) = 2x^2 + 5$, find the average rate of change of $h(x)$ on the interval $x \in [-1,3]$.

(A) $\dfrac{21}{4}$ (B) $\dfrac{17}{4}$ (C) 8   (D) 5   (E) 4

_____ 7. $\displaystyle\lim_{x \to \infty} \dfrac{333 + 4444x^{4444} + 555x^{555}}{111x^{555} + 222x^{444} + 333} =$

(A) 555   (B) 5   (C) 0   (D) 3   (E) ∞

_____ 8. Which of the following **is true** about $f(x) = \dfrac{2x^2 - 15x - 8}{x^3 - 7x^2 - 8x}$

(A) $f(x)$ has a vertical asymptote at $x = 8$ (B) $f(x)$ is an odd function   (C) $\displaystyle\lim_{x \to -\infty} f(x) = \infty$

(D) $f(x)$ has a hole at $\left(8, \dfrac{11}{72}\right)$ (E) $f(x)$ has horizontal asymptote at $y = 0$

_____ 9. The function $f(x) = \begin{cases} 3x + 4, & x < -1 \\ 2 & , x = -1 \\ 2x^2 - 1, & x > -1 \end{cases}$

(A) has a jump at $x = -1$ (B) has a hole at $x = -1$ (C) has a VA at $x = -1$

(D) is continuous at $x = -1$ (E) is an even function

Part II: Free Response
Show all work in the space provided. Use proper notation and show all steps. Remember that on this section, your PROCESS is as important as your PRODUCT.

Given
$$f(x)=2x^2-2x-24 \quad g(x)=x^2+3x-28 \quad k(x)=3x^9-7x^5+x^3-2x \quad p(x)=-2x^6+8x^4+1$$

10. Let $h(x)=\dfrac{g(x)}{f(x)}$

(a) Find the domain of $h(x)$.

(b) Find the **equation** of any vertical asymptote of $h(x)$.

(c) Find the **coordinate**, (x,y), of any removable point discontinuity of $h(x)$.

(d) Find the **equation** of any horizontal asymptote of $h(x)$.

(e) Find the **coordinate**, (x,y), of any x-intercepts of $h(x)$.

11. Let $m(x) = \dfrac{k(x)}{p(x)}$

(a) Is $m(x)$ is even, odd, or neither. Justify.

(b) Find $\displaystyle\lim_{x\to\infty} m(x)$

(c) Find the y-intercept of $m(x)$. List it as an ordered pair.