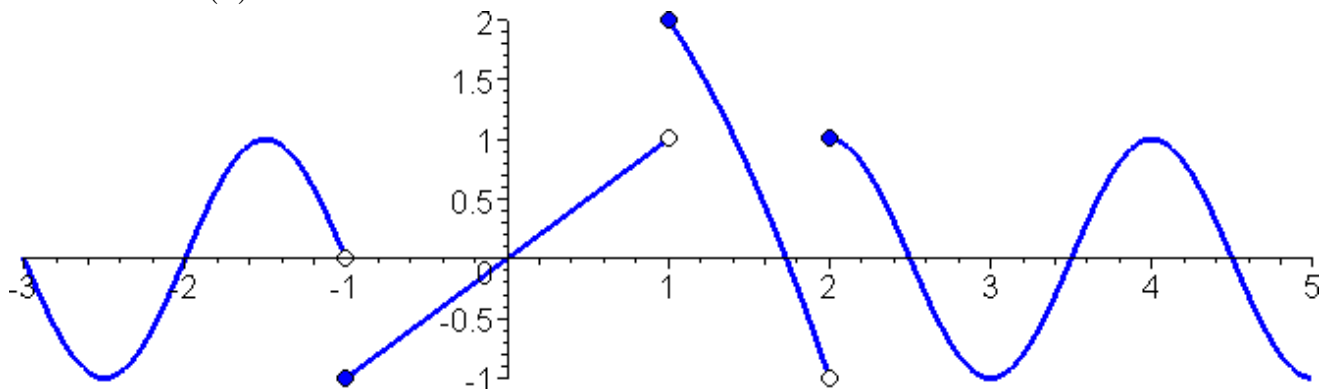PreAP Precalculus
TEST Chapter 2.1-2.3, Form A. No Calculator

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 $-3 \leq x \leq 5$ to answer questions 1- 5.

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

        (A) DNE   (B) 1   (C) 2   (D) ∞ (E) $-\infty$

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

        (A) $(-3,-2)$ (B) $(-1,1)$ (C) $(1,2)$ (D) $(3,5)$ (E) $(2,3)$

_____ 3. $\lim\limits_{x \to 2} f(x) =$

        (A) -1 (B) 2   (C) DNE   (D) ∞ (E) $-\infty$

_____ 4. $f(x)$ has a relative/local minimum of

        (A) -2.5 (B) -1 (C) 3   (D) 5   (E) $f(x)$ has no relative minimum

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

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

      (D) $f(x)$ has a non-removable discontinuity at $x = 1$.   (E) $f(x)$ has an absolute max of 2.

_____ 6. If $h(x) = 2\sqrt{x-3}$, find the average rate of change of $h(x)$ on the interval $x \in [7,19]$.

        (A) $\dfrac{1}{6}$ (B) 3   (C) -3 (D) $\dfrac{1}{3}$ (E) $-\dfrac{1}{3}$

_____ 7. $\lim\limits_{x \to \infty} \dfrac{400000 + 700000x^3 + 200000x^2 + 500000x}{x^4 - 100000} =$

        (A) 400000   (B) -4 (C) 0   (D) 700000   (E) ∞

Part II: Free Response
Show all work BELOW THE LINE. No credit will be given for any work done above the line. Label each part, use proper notation, and box your final answers. Remember that on this section, your PROCESS is as important as your PRODUCT.

Given $f(x) = -2x^2 - 4x + 30$ $\qquad g(x) = 3x^2 - 9x$ $\qquad k(x) = 5x^5 - 4x^3 + x$ $\qquad p(x) = -9x^4 - 7x^2 - 11$

8. 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), and any removable point discontinuity of $h(x)$.

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

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

   (e) Determine algebraically if $m(x)$ is even, odd, or neither.

   (f) Find $\lim\limits_{x \to -\infty} m(x)$

   (g) Find the y-intercept of $m(x)$.