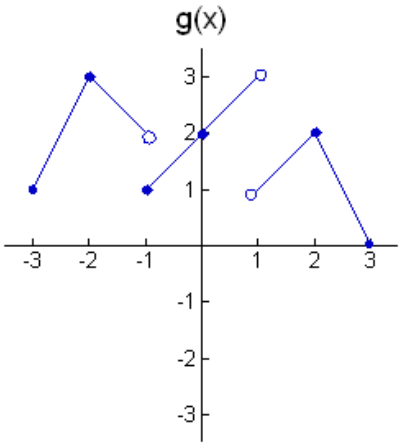
Name_____ Date_____ Period_____

AP Calculus TEST: 1.1-1.4 No Calculator



Part I: Multiple Choice—write the CAPITAL LETTER in the blank to the left of the problem number.

Use the graph of the function $g(x)$ shown at right to answer question 1.

_____ 1. $\lim_{x\to -1^-} g(x+2)+\lim_{x\to 2^+}\left[g(x)+1\right]^3+g(0)=$

(A) 30 (B) 14 (C) 12 (D) 32 (E) DNE

_____ 2. $\lim_{x\to 1}\dfrac{\sqrt{x+3}-2}{x-1}=$

(A) $\frac{1}{4}$ (B) $\frac{1}{8}$ (C) -8 (D) 1 (E) DNE

_____ 3. Evaluate $\lim_{x\to 0}\left(\dfrac{3\tan 6x}{2\sin 2x}+\dfrac{\sin 5x}{x}\right)$

(A) DNE (B) $\frac{11}{2}$ (C) $\frac{19}{2}$ (D) $\frac{3}{2}$ (E) $\frac{47}{10}$

_____ 4. Evaluate $\lim_{x\to 0}\dfrac{\cos 7x+1}{7x+1}$

(A) DNE (B) 0 (C) 2 (D) -2 (E) 4

_____ 5. $\lim_{x\to 8}\dfrac{\frac{4}{x}-\frac{1}{2}}{x-8}=$

(A) DNE (B) -16 (C) 16 (D) $\frac{1}{16}$ (E) $-\frac{1}{16}$

_____ 6. If $\ln(x-3)\le P(x)\le\dfrac{2x-8}{x+5}$, for all x in an interval containing $x=4$, then $\lim_{x\to 4}P(x)=$

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

_____ 7. $\lim_{x\to -2^-}\dfrac{x^2-3x-10}{|3x+6|}=$

(A) $\frac{7}{3}$ (B) $-\frac{7}{3}$ (C) $\frac{8}{3}$ (D) $-\frac{8}{3}$ (E) DNE

_____ 8. $\lim_{x\to -\infty}\dfrac{4x^5+2x^2-3x+1}{\sqrt{9x^{10}+11x^9+12x^2+13x+14}}=$

(A) $-\infty$ (B) ∞ (C) $\frac{4}{3}$ (D) $-\frac{4}{3}$ (E) $\frac{4}{9}$

Part II: Free Response: Answer all questions below the given line. **Show all steps, label parts, and write legibly.**

For $f(x)=\begin{cases}\dfrac{6}{x+4}, & x\le -1\\ x^2+1, & -1\le x<2\\ 3x-5, & 2<x\le 3\\ 4\sqrt{x-2}, & x>3\end{cases}$, find the following.

(a) $\lim\limits_{x\to -4^-} f(x)=$

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

(c) $\lim\limits_{x\to \infty} f(x)=$

(d) Using the 3-step definition of continuity, discuss the continuity of $f(x)$ at $x=2$.

(e) Using the 3-step definition of continuity, discuss the continuity of $f(x)$ at $x=3$.