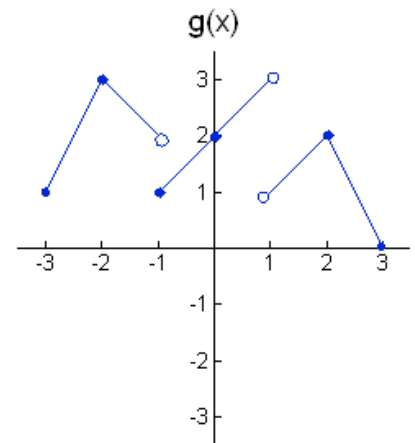


AP Calculus BC TEST: 1.1-1.4

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. $\lim_{x \rightarrow 1^-} g(g(x)) + \lim_{x \rightarrow 2^+} \sqrt{g(x)+6} + g(-1) =$
 (A) 6 (B) 5 (C) 4 (D) 3 (E) DNE

_____ 2. $\lim_{x \rightarrow 16} \frac{\frac{10}{x-1} - \frac{2}{3}}{16-x} =$
 (A) DNE (B) -2 (C) 2 (D) $-\frac{2}{45}$ (E) $\frac{2}{45}$

_____ 3. If $2^{3x-1} \leq P(x) \leq x^3 + 2x + 1$, for all x in an interval containing $x = 1$, then $\lim_{x \rightarrow 1} P(x) =$
 (A) 7 (B) 0 (C) 2 (D) 4 (E) not enough information is given

_____ 4. $\lim_{x \rightarrow \infty} \frac{-2x^7 + 7x^2 - 3x + 1}{\sqrt{4x^{14} + x^{12} + 2x^2 + 3x + 4}} =$
 (A) $-\infty$ (B) $-\frac{1}{2}$ (C) 1 (D) -1 (E) $\frac{1}{2}$

_____ 5. $\lim_{x \rightarrow 8} \frac{x-8}{2-\sqrt{x-4}} =$
 (A) -4 (B) 4 (C) -1 (D) 1 (E) DNE

_____ 6. Evaluate $\lim_{x \rightarrow 0} \left(\frac{2 \tan 3x}{\sin 4x} - \frac{4x}{\sin 10x} \right) =$
 (A) $\frac{11}{10}$ (B) $-\frac{5}{2}$ (C) $\frac{7}{20}$ (D) $\frac{34}{15}$ (E) DNE

_____ 7. $\lim_{x \rightarrow 3^+} \frac{x^2 |2x-6|}{x^2 - 9} =$
 (A) DNE (B) 3 (C) -3 (D) $-\frac{32}{7}$ (E) $\frac{32}{7}$

_____ 8. Evaluate $\lim_{x \rightarrow 0} \frac{\tan 4x}{\sec 5x} =$
 (A) DNE (B) 0 (C) $\frac{4}{5}$ (D) $\frac{5}{4}$ (E) 1

Part II: Free Response: Answer all questions in the rectangle provided for each problem. **Show all steps, use proper notation, and write legibly.**

9. For $f(x) = \begin{cases} \ln|x+2|, & x < -3 \\ \frac{x+3}{x-1}, & -3 \leq x < -1 \\ \frac{-2}{x}, & -1 \leq x < 1 \\ 1-3x, & 1 < x \leq 4 \\ \frac{1}{x} \sin\left(\frac{\pi}{2}x\right), & x > 4 \end{cases}$, find the following.

(a) $\lim_{x \rightarrow 0^-} f(x) =$

(b) $\lim_{x \rightarrow -1} f(x) =$

(c) $\lim_{x \rightarrow \infty} f(x) =$

(d) $\lim_{x \rightarrow -\infty} f(x) =$

(e) Using the 3-step definition of continuity, discuss the continuity of $f(x)$ at $x=1$.

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