AP Practice Limits HW

NON Caculator

2.

$$\lim_{x\to 0}\frac{5x^4+8x^2}{3x^4-16x^2} \text{ is}$$

(A) $-\frac{1}{2}$ (B) 0 (C) 1 (D) $\frac{5}{3}$ (E) nonexistent

4.

$$\lim_{x\to 0}\frac{\sin x\cos x}{x} \text{ is}$$

(A) -1 (B) 0 (C) 1 (D) $\frac{\pi}{4}$ (E) nonexistent

7.

If $f(x)=\begin{cases}\ln x & \text{for } 0<x\le 2\\ x^2\ln 2 & \text{for } 2<x\le 4,\end{cases}$ then $\lim_{x\to 2} f(x)$ is

(A) $\ln 2$ (B) $\ln 8$ (C) $\ln 16$ (D) 4 (E) nonexistent

8.

x	0	1	2
$f(x)$	1	k	2

The function f is continuous on the closed interval $[0,2]$ and has values that are given in the table above. The equation $f(x)=\frac{1}{2}$ must have at least two solutions in the interval $[0,2]$ if $k=$

(A) 0 (B) $\frac{1}{2}$ (C) 1 (D) 2 (E) 3

Calculator active:

9.

Let f be the function given by $f(x)=\frac{(x-1)(x^2-4)}{x^2-a}$. For what positive values of a is f continuous for all real numbers x?

(A) None
(B) 1 only
(C) 2 only
(D) 4 only
(E) 1 and 4 only

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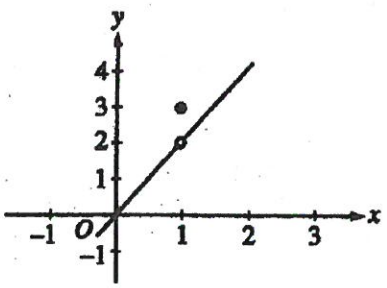
14.



Graph of f

The graph of the function f is shown in the figure above. The value of $\lim_{x\to 1} \sin(f(x))$ is

(A) 0.909 (B) 0.841 (C) 0.141 (D) –0.416 (E) nonexistent

Free response.

6. (No Calculator)

Let f be the function defined as follows: $f(x)=\begin{cases}|x-1|+2, & x<1\\ ax^2+bx, & x\geq 1\end{cases}$ where a and b are constants.

(a) If $a=2$ and $b=3$, is f continuous for all x ? Justify your answer.

(b) Describe all values of a and b for which f is a continuous function.

10. (No Calculator) – **Part (c) only**

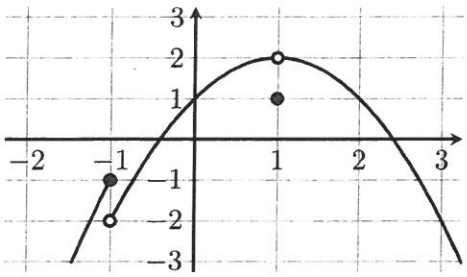
The function f defined by $f(x)=\sqrt{25-x^2}$ for $-5\leq x\leq 5$.

(c) Let g be the function defined by $g(x)=\begin{cases}f(x) & \text{for } -5\leq x\leq -3\\ x+7 & \text{for } -3<x\leq 5\end{cases}$

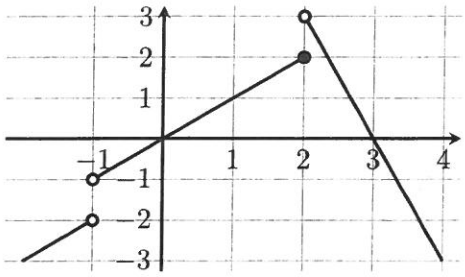
Is g continuous at $x=-3$? Use the definition of continuity to explain your answer.

Graphical limits using limit laws **Name:** _____

Graph of f



Graph of g



1. $\lim_{x\to 0}(f(x)+g(x))$

2. $\lim_{x\to 1}(f(x)g(x))$

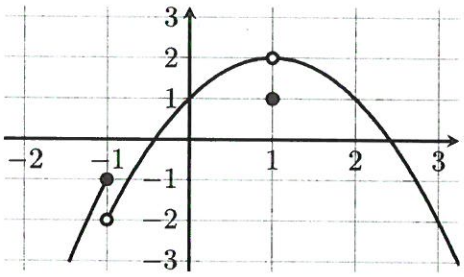
3. $\lim_{x\to 1}(f(x)+g(x))$

4. $\lim_{x\to 2^+}(2f(x)+3g(x))$

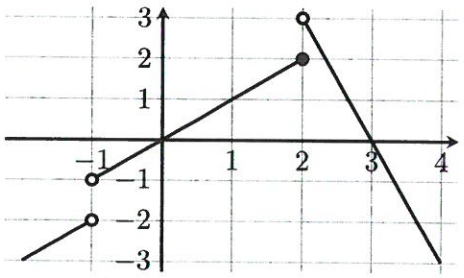
5. $\lim_{x\to 2^-}(x^2+(\ln x)\cdot g(x))$

6. $\lim_{x\to 2}(f(x)-g(x))$

Graph of f



Graph of g



7. $\lim_{x \to 3} \dfrac{g(x)}{f(x)}$

8. $\lim_{x \to 3^+} \dfrac{f(x)}{g(x)}$

9. $\lim_{x \to 3} \dfrac{f(x)}{g(x)}$

10. $\lim_{x \to 1} \sqrt{1 + f(x) + g(x)}$

11. $\lim_{x \to -1} (f(x) + g(x))$