

Key

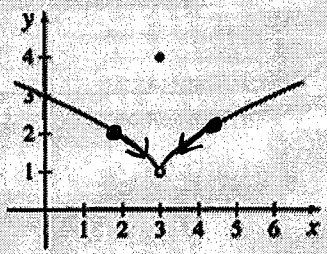
1.1 AP Practice Problems

1. To investigate $\lim_{x \rightarrow 1^-} \sqrt{1-x}$ using a table, evaluate $f(x) = \sqrt{1-x}$, by choosing
- (A) numbers close to 0, some slightly less than 0 and some slightly greater than 0.
 - (B) only numbers slightly less than 1.
 - (C) only numbers slightly greater than 1.
 - (D) numbers close to 1, some slightly less than 1 and some slightly greater than 1.

2. $\lim_{x \rightarrow -2^+} x^3 = -8$ is called a
- (A) lower limit
 - (B) negative limit
 - (C) positive limit
 - (D) right-hand limit

3. "The limit as x approaches 0 of the function $f(x) = \cos x$ is equal to the number 1," is written symbolically as
- (A) $\lim_{\cos x \rightarrow 0} \cos x = 1$
 - (B) $\lim_{x \rightarrow \cos x} \cos x = 1$
 - (C) $\lim_{x \rightarrow 0} \cos x = 1$
 - (D) $\lim_{x \rightarrow 1} \cos x = 0$

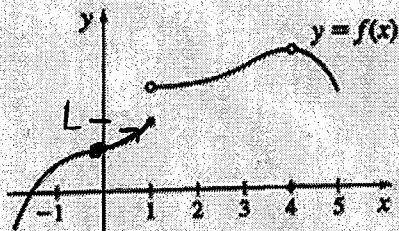
4. The graph of a function f is given below.



Which statement best describes $\lim_{x \rightarrow 3} f(x)$?

- (A) $\lim_{x \rightarrow 3} f(x) = 1$
- (B) $\lim_{x \rightarrow 3} f(x) = 3$
- (C) $\lim_{x \rightarrow 3} f(x) = 4$
- (D) $\lim_{x \rightarrow 3} f(x)$ doesn't exist.

5. The graph of a piecewise function f is shown.



Use the graph to determine which of the following statements is true.

- (A) $\lim_{x \rightarrow -1^+} f(x)$ does not exist. (B) $\lim_{x \rightarrow 1^-} f(x) = f(1)$.
 (C) $\lim_{x \rightarrow 1} f(x)$ exists. (D) $\lim_{x \rightarrow 4} f(x) = f(4)$.

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

$$f(1) = L$$

} same value ✓

81 6. The table below gives values of three functions near 1.

| x | 0.7 | 0.8 | 0.9 | 0.95 | 1 | 1.05 | 1.1 | 1.2 | 1.3 |
|--------|------|-------|--------|--------|-----------|--------|--------|-------|-------|
| $f(x)$ | 0 | 0 | 0 | 0 | 0 | 0.9 | 0.9 | 0.9 | 0.9 |
| $g(x)$ | -0.9 | -0.95 | -0.095 | -0.009 | undefined | 0.009 | 0.095 | 0.95 | 0.995 |
| $h(x)$ | 1.0 | 0.08 | 0.008 | 0.0008 | 1 | -0.005 | -0.025 | -0.05 | -0.25 |

For which of these functions does the table suggest that the limit as x approaches 1 is 0?

- (A) f only (B) h only (C) f and g only (D) g and h only

7. Interpret $\lim_{x \rightarrow 2} (x^2 + 3x - 4) = 10$.

As x approaches 2 (from both left and right of 2), the y -value is consistently moving closer towards 10.

8. Use a calculator to create a table to investigate $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$

| x | -0.1 | -0.01 | -0.001 | 0.001 | 0.01 | 0.1 |
|--------|--------|--------|--------|--------|-------|--------|
| $f(x)$ | 0.9516 | 0.9950 | 0.9995 | 1.0005 | 1.005 | 1.0517 |

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$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$