Class prep quiz on sections 2.2–2.3, Stewart's Calculus (8th ed.)

1. Suppose we know the following information about a function $g(x)$:

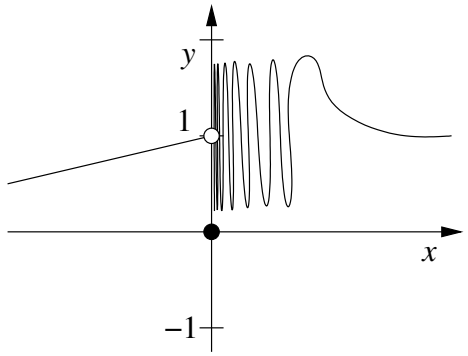
x	-1.01	-1.001	-1.0001	-1	-0.9999	-0.999	-0.99
$g(x)$	-0.99	-0.999	-0.9999	0	0.9999	0.999	0.99

What is the most reasonable conclusion to draw about $\lim_{x\to -1} g(x)$?

(a) $\lim_{x\to -1} g(x) = -1$ (b) $\lim_{x\to -1} g(x) = 0$

(c) $\lim_{x\to -1} g(x) = +1$ (d) $\lim_{x\to -1} g(x)$ does not exist

2. Suppose the graph of $y = f(x)$ looks like:



Which of the following statements seems most likely to be correct?

(a) $\lim_{x\to 0} f(x)$ does not exist because $f(0) = 0$.

(b) $\lim_{x\to 0} f(x)$ does not exist because as $x \to 0$, $f(x)$ does not approach just one y value.

(c) $\lim_{x\to 0} f(x)$ does not exist because $\lim_{x\to 0^-} f(x)$ and $\lim_{x\to 0^+} f(x)$ both exist, but have different values.

(d) $\lim_{x\to 0} f(x) = 1$.

3. Suppose we know that $\lim_{x\to 7} f(x) = A$ and $\lim_{x\to 7} g(x) = B$. Which of the following values are **not** determined by A and B?

(a) $\lim_{x\to 7} f(x)g(x)$

(b) $\lim_{x\to 7} f(x) + g(x)$

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

(d) Trick question: All of these values are determined by A and B.

4. Let $f(x)$ be an unspecified polynomial function. What is the best explanation of why we can't evaluate $\lim_{x\to 3} \dfrac{f(x)-f(3)}{x-3}$ by substituting $x=3$?

   (a) The denominator of $\dfrac{f(x)-f(3)}{x-3}$ is 0 at $x=3$.

   (b) Trick question: We *can* evaluate $\lim_{x\to 3} f(x)$ by substituting $x=3$.

   (c) Both the numerator and denominator of $\dfrac{f(x)-f(3)}{x-3}$ are 0 at $x=3$.

   (d) The numerator of $\dfrac{f(x)-f(3)}{x-3}$ is 0 at $x=3$.