

Take-Home Quiz 1 ANSWER KEYPART A: State whether the following statements are *true* (T) or *false* (F).

1. F . In fact: $\lim_{x \rightarrow 0} 2 = 2$.
2. F . In fact: $\lim_{x \rightarrow -1} \frac{x^2 + x}{x^2 - 1} = \frac{1}{2}$.
3. T . The $\lim_{x \rightarrow 1} \frac{3x^2 - 6x + 3}{x - 1} = 0$.
4. F . In fact: $\lim_{x \rightarrow 2} \frac{3 - \sqrt{x+7}}{2 - x} = \frac{1}{6}$.
5. T . The $\lim_{x \rightarrow a^+} (mx + b) = ma + b$.
6. T . The $\lim_{x \rightarrow \infty} \frac{x}{\sqrt{x^2 - 4}} = 1$.
7. F . In fact: $\lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2 - 4}} = -1$.
8. T . The $\lim_{x \rightarrow 2^+} \sqrt{x - 2} = 0$.
9. F . In fact: $\lim_{x \rightarrow 2} \sqrt{x - 2}$ does *not* exist.
10. T . The $\lim_{x \rightarrow 2^-} \sqrt{x - 2}$ does *not* exist.
11. T . The $\lim_{x \rightarrow \infty} \frac{x^3}{x^2 + 1} = \infty$.
12. F . It is False that: To *prove* that $\lim_{x \rightarrow 2} (3x - 2) = 4$, we must show that , for *some* neighborhood $N = (4 - \epsilon, 4 + \epsilon)$ of 4, there is a deleted neighborhood $D = (2 - \delta, 2) \cup (2, 2 + \delta)$ of 2 such that for all x in D , $3x - 2$ is in N .
13. T . It is True that: To *prove* that $\lim_{x \rightarrow 2} (3x - 2) = 4$, we must show that , for *any given* neighborhood $N = (4 - \epsilon, 4 + \epsilon)$ of 4, there is a deleted neighborhood $D = (2 - \delta, 2) \cup (2, 2 + \delta)$ of 2 such that for all x in D , $3x - 2$ is in N .
14. F . It is False that: The function $f(x) = \frac{2}{x - 3}$ can be made *continuous* at $x = 3$.
15. T . It is True that: The function $f(x) = \frac{2x^2 - 12x + 18}{x - 3}$ can be made *continuous* at $x = 3$.

PART B: *Circle* the *one* correct choice.

1. $\lim_{x \rightarrow 3^+} \frac{|x - 3|}{x - 3}$ is
b) 1
2. $\lim_{x \rightarrow 3^-} \frac{|x - 3|}{x - 3}$ is
d) -1
3. $\lim_{x \rightarrow 3} \frac{|x - 3|}{x - 3}$ is
e) none of the above
4. $\lim_{x \rightarrow +\infty} \frac{|x - 3|}{x - 3}$ is
b) 1
5. $\lim_{x \rightarrow -\infty} \frac{|x - 3|}{x - 3}$ is
c) -1
6. $\lim_{x \rightarrow -2} \frac{x^2 - x - 6}{x^2 + 3x + 2}$
b) is 5
7. $\lim_{x \rightarrow a} \frac{x^2 - a}{x - a^2}$, for $a \neq 0$ or $a \neq 1$,
d) is -1
8. $\lim_{x \rightarrow a} a$ is
b) a
9. If $f(x) = |x - 3|$, then $\lim_{x \rightarrow 3^+} \frac{f(x) - f(3)}{x - 3}$ is
a) 1
10. If $f(x) = |x - 3|$, then $\lim_{h \rightarrow 0^-} \frac{f(3 + h) - f(3)}{h}$ is
c) -1