This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Evaluate the one-sided limit of the function $f(x)$ below, if possible.

$$\lim_{x \to 8^-} \frac{3}{(x-8)^5} + 5$$

The solution is $-\infty$

A. $-\infty$

B. ∞

C. $f(8)$

D. The limit does not exist

E. None of the above

General Comment: General comments: You should be able to graph the rational function displayed. If not, go back to Module 7 to learn about the general shape of rational functions.

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2. Based on the information below, which of the following statements is always true? $f(x)$ approaches 4.19 as x approaches ∞. The solution is None of the above are always true.

A. $f(x)$ is close to or exactly ∞ when x is large enough.

B. $f(x)$ is close to or exactly 4.19 when x is large enough.

C. $f(x)$ is undefined when x is large enough.

D. $f(x)$ is undefined when $f(x)$ is large enough.

E. None of the above are always true.

General Comment: General comments: The limit tells you what happens as the x-values approach ∞. It says **absolutely nothing** about what is happening exactly at $f(x)$!

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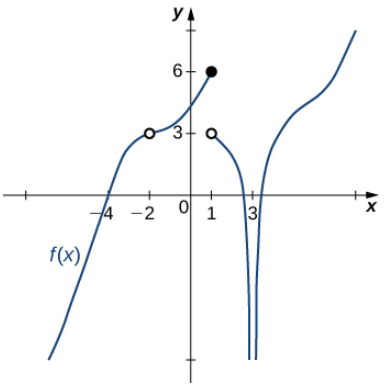
3. For the graph below, evaluate the limit: $\lim_{x \to -2} f(x)$.



The solution is 3

A. $-\infty$

B. -2

C. 3

D. The limit does not exist

E. None of the above

General Comment: General Comments: Remember that the limit does not exist if the left-hand and right-hand limits do not match.

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4. Evaluate the limit below, if possible.

$$\lim_{x \to 4} \frac{\sqrt{6x-8}-4}{7x-28}$$

The solution is None of the above

A. ∞

You likely believed that since the denominator is equal to 0, the limit is infinity.

B. 0.018

You likely learned L'Hospital's Rule in a previous course, but misapplied it here.

C. 0.350

You likely tried to use a shortcut to find the limit of a function that only works for when the numerator/denominator are polynomials.

D. 0.125

You likely memorized how to solve the similar homework problem and used the same formula here.

E. None of the above

* This is the correct option as the limit is 0.107.

General Comment: General comments: It is difficult to imagine the graph of this function, so you need to test values close to $x = 4$.

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0. To estimate the one-sided limit of the function below as x approaches 1 from the left, which of the following sets of numbers should you use?

$$\frac{\frac{1}{x}-1}{x-1}$$

The solution is $\{0.9000, 0.9900, 0.9990, 0.9999\}$

A. $\{1.0000, 0.9000, 0.9900, 0.9990\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 1 doesn't help us estimate the limit.

B. $\{1.1000, 1.0100, 1.0010, 1.0001\}$

These values would estimate the limit of 1 on the right.

C. $\{0.9000, 0.9900, 0.9990, 0.9999\}$

This is correct!

D. $\{0.9000, 0.9900, 1.0100, 1.1000\}$

These values would estimate the limit at the point and not a one-sided limit.

E. $\{1.0000, 1.1000, 1.0100, 1.0010\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 1 doesn't help us estimate the limit.

General Comment: General Comments: To evaluate a one-sided limit, we want to put numbers close to the limit. We can't use the limit value itself if it results in $\frac{0}{0}$ or $\frac{\infty}{\infty}$