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

$$\lim_{x \to 2^-} \frac{8}{(x-2)^6} + 8$$

The solution is ∞

A. $-\infty$

B. $f(2)$

C. ∞

D. The limit does not exist

E. None of the above

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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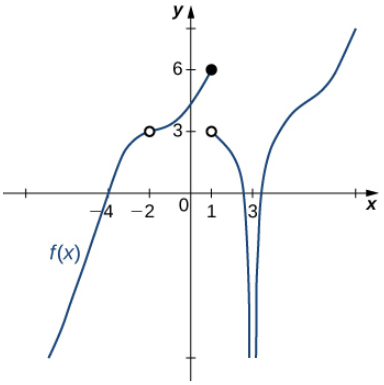
72. For the graph below, find the value(s) a that makes the limit true: $\lim_{x \to a} f(x) = 0$.



The solution is Multiple a make the limit true.

A. 3

B. -4

C. 0

D. Multiple a make the limit true.

E. No a make the limit true.

General Comments: There can be multiple a values that make the limit true! For the limit, draw a horizontal line and determine if an x value makes the limit true.

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73. Based on the information below, which of the following statements is always true? As x approaches 2, $f(x)$ approaches ∞. The solution is $f(x)$ is undefined when x is close to or exactly 2.

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

B. $f(x)$ is close to or exactly 2 when x is large enough.

C. $f(x)$ is undefined when x is close to or exactly 2.

D. x is undefined when $f(x)$ is close to or exactly ∞.

E. None of the above are always true.

General comments: The limit tells you what happens as the x-values approach 2. It says **absolutely nothing** about what is happening exactly at $f(x)$!

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74. Evaluate the limit below, if possible.

$$\lim_{x\to 9} \frac{\sqrt{7x-14}-7}{5x-45}$$

The solution is None of the above

A. 0.014

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

B. 0.071

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

C. 0.529

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. ∞

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

E. None of the above

* This is the correct option as the limit is 0.100.

General comments: It is difficult to imagine the graph of this function, so you need to test values close to $x = 9$.

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75. To estimate the one-sided limit of the function below as x approaches 2 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{2}{x}-1}{x-2}$$

The solution is $\{2.1000, 2.0100, 2.0010, 2.0001\}$

A. $\{2.0000, 2.1000, 2.0100, 2.0010\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 2 doesn't help us estimate the limit.

B. $\{2.0000, 1.9000, 1.9900, 1.9990\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 2 doesn't help us estimate the limit.

C. $\{1.9000, 1.9900, 1.9990, 1.9999\}$

These values would estimate the limit of 2 on the left.

D. $\{1.9000, 1.9900, 2.0100, 2.1000\}$

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

E. $\{2.1000, 2.0100, 2.0010, 2.0001\}$

This is correct!

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 $\frac{\infty}{\infty}$
