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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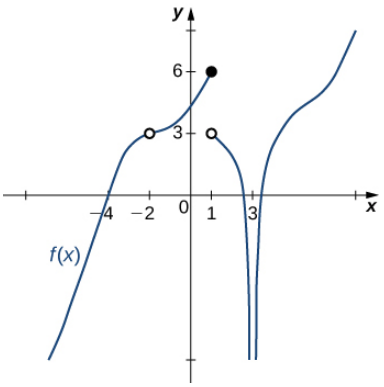
71. For the graph below, find the value(s) a that makes the limit true: $\lim_{x \to a} f(x)$ does not exist.



The solution is 1

A. 1

B. 3

C. -2

D. Multiple a make the limit true.

E. No a make the limit true.

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

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72. Based on the information below, which of the following statements is always true? $f(x)$ approaches 13.42 as x approaches ∞. The solution is $f(x)$ is close to or exactly 13.42 when x is large enough.

A. $f(x)$ is close to or exactly 13.42 when x is large enough.

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

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

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

E. None of the above are always true.

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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73. To estimate the one-sided limit of the function below as x approaches 6 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{6}{x}-1}{x-6}$$

The solution is $\{6.1000, 6.0100, 6.0010, 6.0001\}$

A. $\{6.0000, 6.1000, 6.0100, 6.0010\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 6 doesn't help us estimate the limit.

B. $\{5.9000, 5.9900, 6.0100, 6.1000\}$

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

C. $\{6.0000, 5.9000, 5.9900, 5.9990\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 6 doesn't help us estimate the limit.

D. $\{5.9000, 5.9900, 5.9990, 5.9999\}$

These values would estimate the limit of 6 on the left.

E. $\{6.1000, 6.0100, 6.0010, 6.0001\}$

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

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

$$\lim_{x\to -1^+} \frac{8}{(x+1)^4} + 6$$

The solution is ∞

A. $f(-1)$

B. $-\infty$

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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75. Evaluate the limit below, if possible.

$$\lim_{x\to 8} \frac{\sqrt{7x-20}-6}{4x-32}$$

The solution is None of the above

A. ∞

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

B. 0.661

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

C. 0.083

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

D. 0.021

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

E. None of the above

* This is the correct option as the limit is 0.146.

General comments: It is difficult to imagine the graph of this function, so you need to test values close to $x = 8$.
