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 limit below, if possible.

$$\lim_{x \to 5} \frac{\sqrt{8x - 15} - 5}{3x - 15}$$

The solution is 0.267, which is option C.

A. 0.033

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

B. 0.100

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

C. 0.267

D. ∞

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

E. None of the above

If you got a limit that does not match any of the above, please contact the coordinator.

General Comment: General comments: It is difficult to imagine the graph of this function, so you need to test values close to $x = 5$.

---

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

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

The solution is $f(-8)$, which is option B.

A. $-\infty$

B. $f(-8)$

C. ∞

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.

---

3. Based on the information below, which of the following statements is always true?

As x approaches 8, $f(x)$ approaches ∞.

The solution is $f(x)$ is undefined when x is close to or exactly 8., which is option A.

A. $f(x)$ is undefined when x is close to or exactly 8.

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

C. $f(x)$ is close to or exactly 8 when x is large enough.

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

E. None of the above are always true.

General Comment: The limit tells you what happens as the x-values approach 8. It says **absolutely nothing** about what is happening exactly at $f(8)$!

---

4. Based on the information below, which of the following statements is always true?

$$As\ x\ approaches\ 1,\ f(x)\ approaches\ 9.895.$$

The solution is $f(x)$ is close to or exactly 9.895 when x is close to 1, which is option C.

A. $f(x)$ is close to or exactly 1 when x is close to 9.895

B. $f(x) = 9.895$ when x is close to 1

C. $f(x)$ is close to or exactly 9.895 when x is close to 1

D. $f(x) = 1$ when x is close to 9.895

E. None of the above are always true.

General Comment: The limit tells you what happens as the x-values approach 1. It says **absolutely nothing** about what is happening exactly at $f(1)$!

---

5. To estimate the one-sided limit of the function below as x approaches 5 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{5}{x} - 1}{x - 5}$$

The solution is $\{5.1000, 5.0100, 5.0010, 5.0001\}$, which is option A.

A. $\{5.1000, 5.0100, 5.0010, 5.0001\}$

This is correct!

B. $\{4.9000, 4.9900, 4.9990, 4.9999\}$

These values would estimate the limit of 5 on the left.

C. $\{4.9000, 4.9900, 5.0100, 5.1000\}$

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

D. $\{5.0000, 4.9000, 4.9900, 4.9990\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 5 doesn't help us estimate the limit.

E. $\{5.0000, 5.1000, 5.0100, 5.0010\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 5 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 $\frac{\infty}{\infty}$

---

6. Evaluate the limit below, if possible.

$$\lim_{x \to 8} \frac{\sqrt{8x-15}-7}{7x-56}$$

The solution is 0.082, which is option A.

A. 0.082

* This is the correct option.

B. 0.404

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. 0.071

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

D. ∞

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

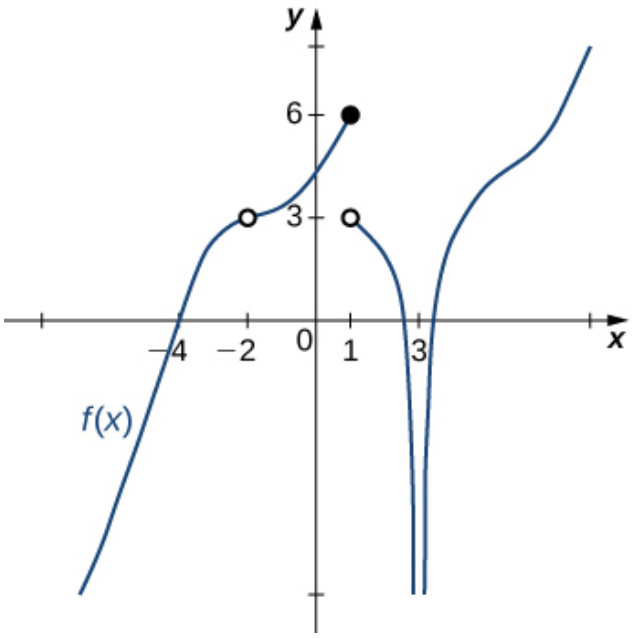
E. None of the above

If you got a limit that does not match any of the above, please contact the coordinator.

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

---

7. For the graph below, evaluate the limit: $\lim_{x \to -4} f(x)$.



The solution is 0, which is option C.

A. $-\infty$

B. -6

C. 0

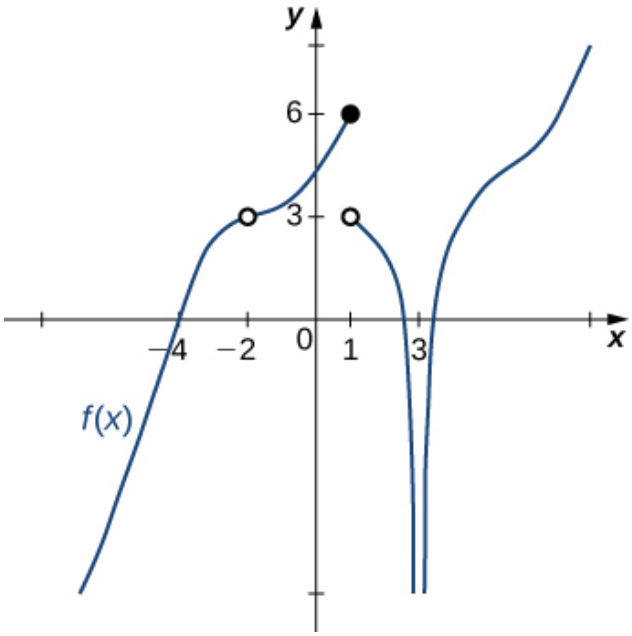
D. The limit does not exist

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.

---

8. For the graph below, evaluate the limit: $\lim_{x \to -4} f(x)$.



The solution is 0, which is option A.

A. 0

B. $-\infty$

C. -6

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.

---

9. To estimate the one-sided limit of the function below as x approaches 5 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{5}{x} - 1}{x - 5}$$

The solution is $\{5.1000, 5.0100, 5.0010, 5.0001\}$, which is option A.

A. $\{5.1000, 5.0100, 5.0010, 5.0001\}$

This is correct!

B. $\{5.0000, 5.1000, 5.0100, 5.0010\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 5 doesn't help us estimate the limit.

C. $\{5.0000, 4.9000, 4.9900, 4.9990\}$

If we get $\frac{0}{0}$ or $\frac{\infty}{\infty}$, the value 5 doesn't help us estimate the limit.

D. $\{4.9000, 4.9900, 4.9990, 4.9999\}$

These values would estimate the limit of 5 on the left.

E. $\{4.9000, 4.9900, 5.0100, 5.1000\}$

These values would estimate the limit at the point and not a one-sided 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 $\frac{\infty}{\infty}$

---

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

$$\lim_{x \to 4^+} \frac{-1}{(x+4)^8} + 7$$

The solution is $f(4)$, which is option B.

A. ∞

B. $f(4)$

C. $-\infty$

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.
