2.2 Hmwk - The Limit of a Function (Homework)

INSTRUCTOR
Francis Adjei
Texas A&M University at Galveston

Past Due **Due Date:** FRI, JAN 30, 2026 11:59 PM CST

Current Score: 20 / 20 POINTS | 100.0 %

Due date has passed. No changes can be made without an approved extension request.
You may not be granted an extension if you have already viewed the answer key.

VIEW ANSWER KEY

Scoring and Assignment Information

QUESTION	1	2	3	4	5	6	7	8	9
POINTS	3 / 3	2.5 / 2.5	0.5 / 0.5	0.5 / 0.5	2.5 / 2.5	1 / 1	0.5 / 0.5	3.5 / 3.5	6 / 6

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

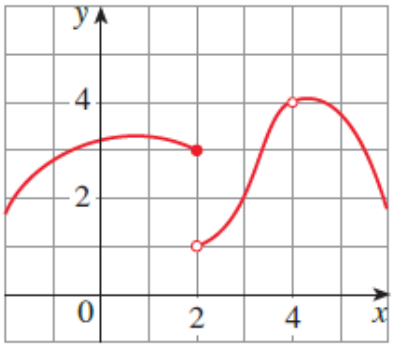
Your best submission for each question part is used for your score.

1. **[3 / 3 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 2.2.004.

Use the given graph of f to state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{x \to 2^-} f(x)$

3 ✓ Fantastic job!

(b) $\lim_{x \to 2^+} f(x)$

1 ✓ Excellent!

(c) $\lim_{x \to 2} f(x)$

DNE ✓ Perfect!

(d) $f(2)$

3 ✓ Fantastic job!

(e) $\lim_{x \to 4} f(x)$

4 ✓ Awesome!

(f) $f(4)$

DNE ✓ Good work!

Resources

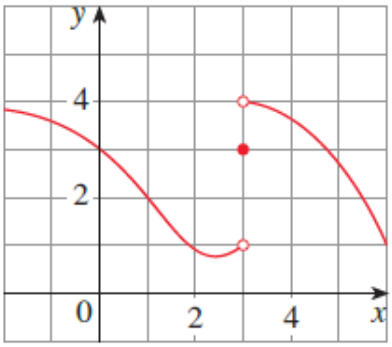
Read It

2. **[2.5 / 2.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 2.2.005.

For the function *f* whose graph is given, state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{x \to 1} f(x)$

2 ✔ That's great!

(b) $\lim_{x \to 3^-} f(x)$

1 ✔ That's right!

(c) $\lim_{x \to 3^+} f(x)$

4 ✔ Fantastic job!

(d) $\lim_{x \to 3} f(x)$

DNE ✔ Excellent job!

(e) $f(3)$

3 ✔ Very nice!

Resources

Read It

3. **[0.5 / 0.5 Points]**

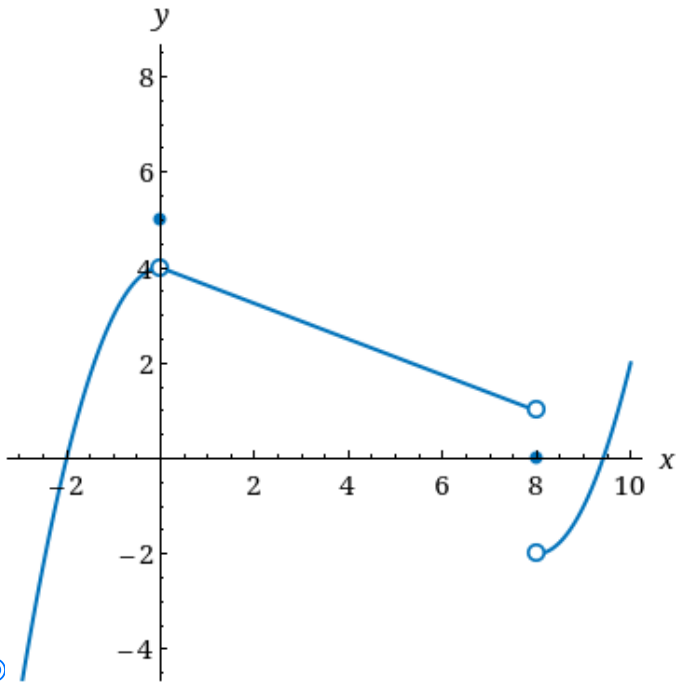
DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 2.2.016.

Sketch the graph of an example of a function f that satisfies all of the given conditions.

$$\lim_{x \to 0} f(x) = 4, \quad \lim_{x \to 8^-} f(x) = 1, \quad \lim_{x \to 8^+} f(x) = -2, \quad f(0) = 5, \quad f(8) = 0$$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8
6
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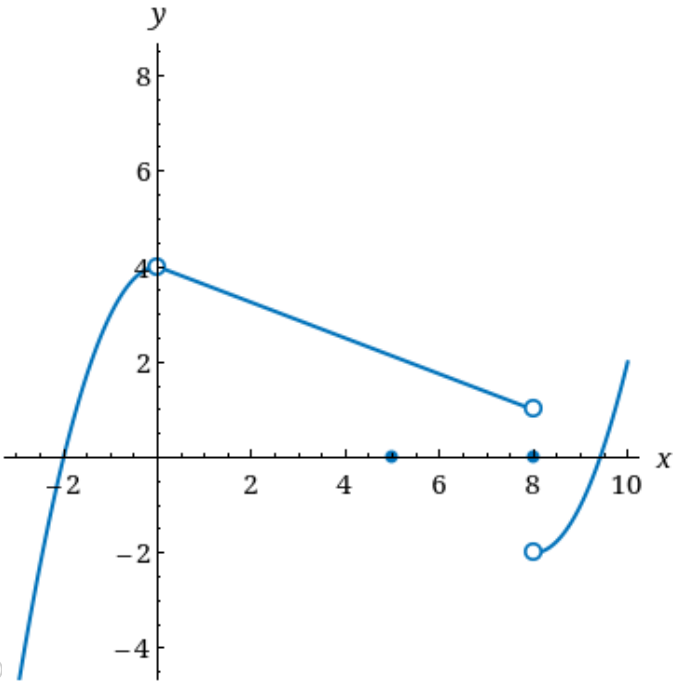
−4
−2
2
4
6
8
10
x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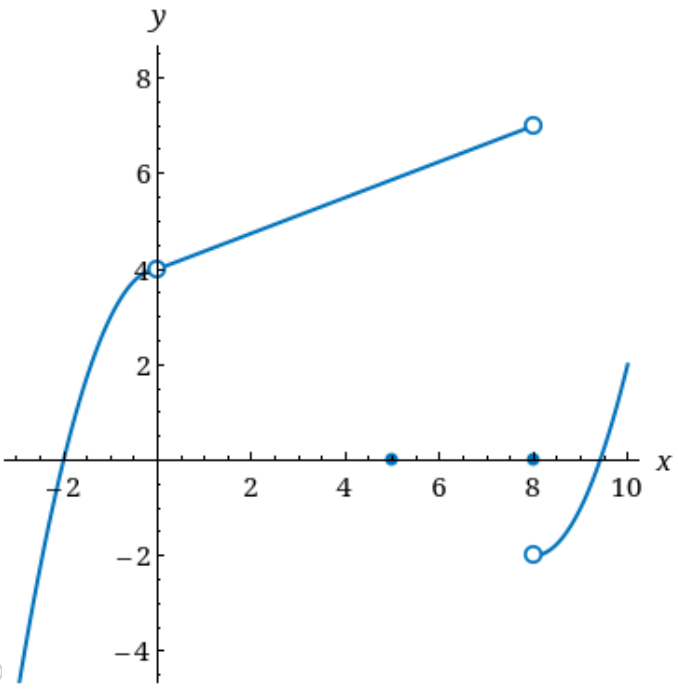
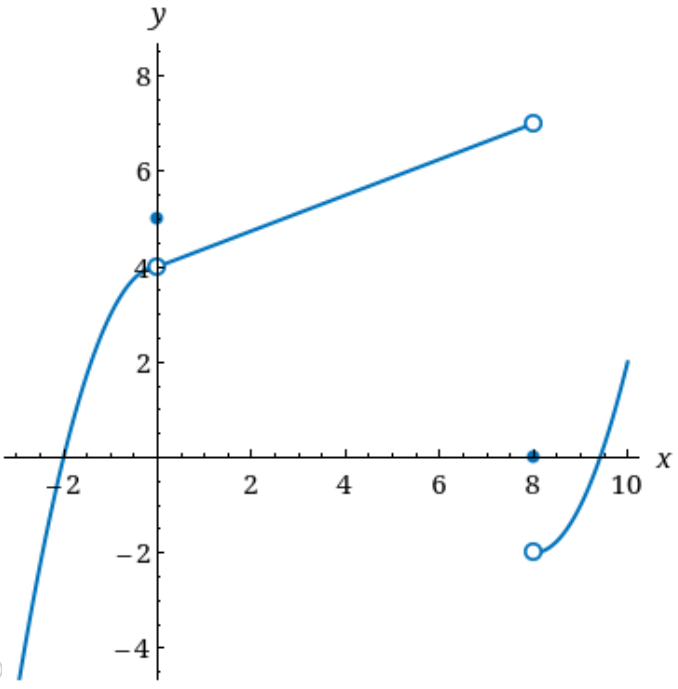




✔ Nicely done.

Resources

Read It

4. **[0.5 / 0.5 Points]**

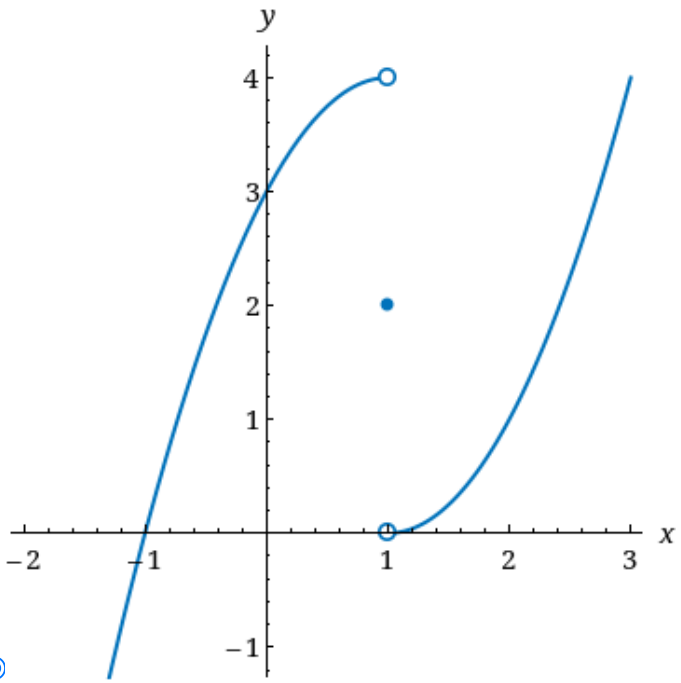
DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 2.2.015.

Sketch the graph of an example of a function f that satisfies all of the given conditions.

$$\lim_{x \to 1^-} f(x) = 4, \quad \lim_{x \to 1^+} f(x) = 0, \quad f(1) = 2$$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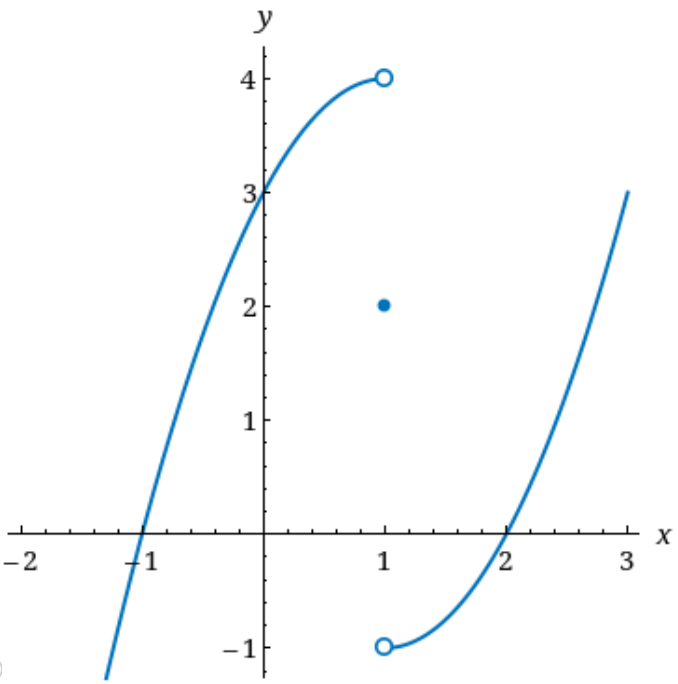
x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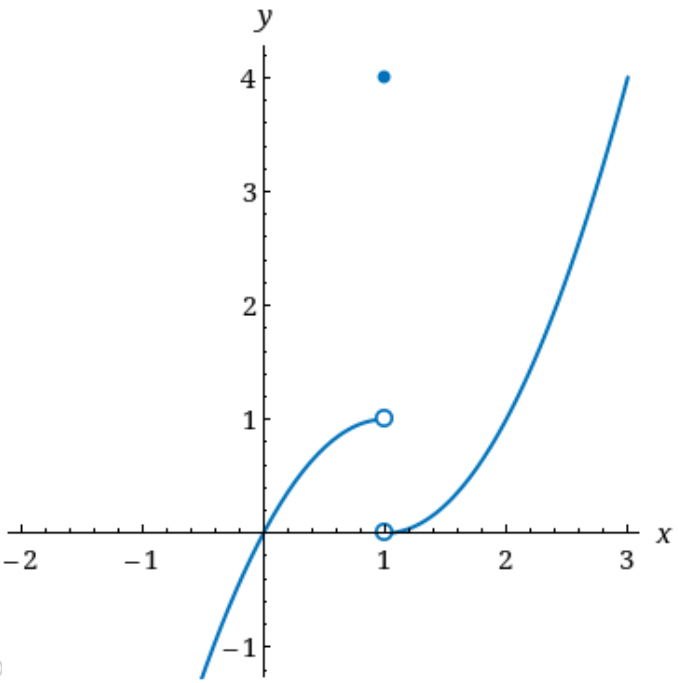
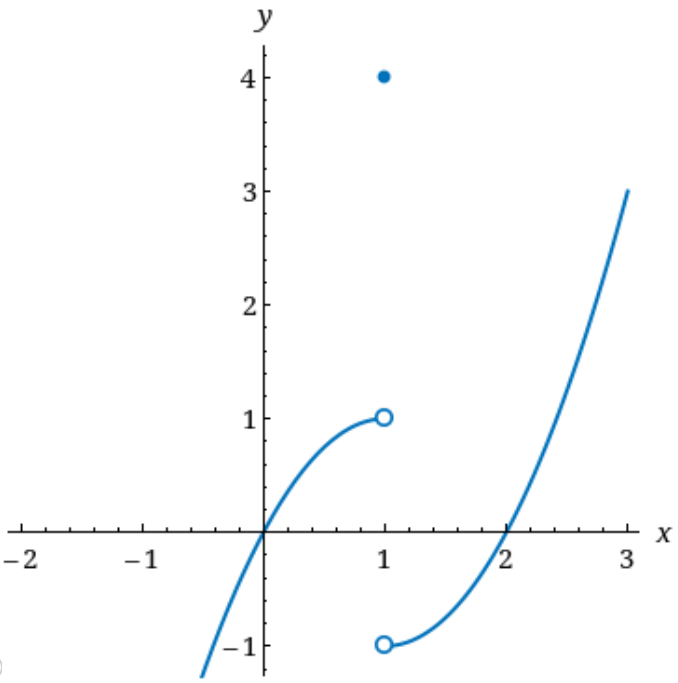




✔ Well done!

Resources

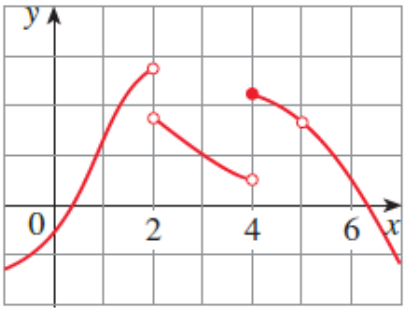
Read It

5. **[2.5 / 2.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 2.2.007.

For the function g whose graph is shown, find a number a that satisfies the given description.



(a) $\lim_{x \to a} g(x)$ does not exist but $g(a)$ is defined.

$a =$ 4 ✓ Great job.

(b) $\lim_{x \to a} g(x)$ exists but $g(a)$ is not defined.

$a =$ 5 ✓ That's right!

(c) $\lim_{x \to a^-} g(x)$ and $\lim_{x \to a^+} g(x)$ both exist but $\lim_{x \to a} g(x)$ does not exist.

smaller value $a =$ 2 ✓ You're right!

larger value $a =$ 4 ✓ Awesome job!

(d) $\lim_{x \to a^+} g(x) = g(a)$ but $\lim_{x \to a^-} g(x) \neq g(a)$.

$a =$ 4 ✓ Very nice!

Resources

Read It

6. **[1 / 1 Points]**

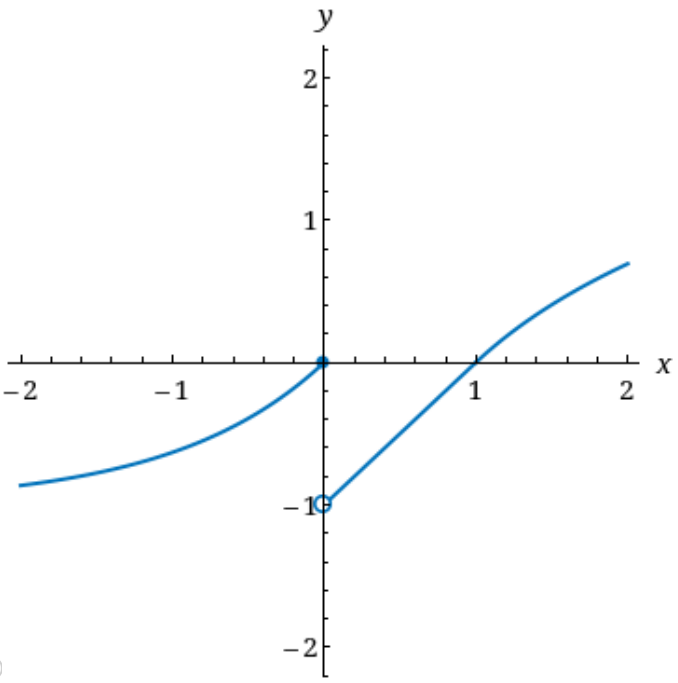
DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

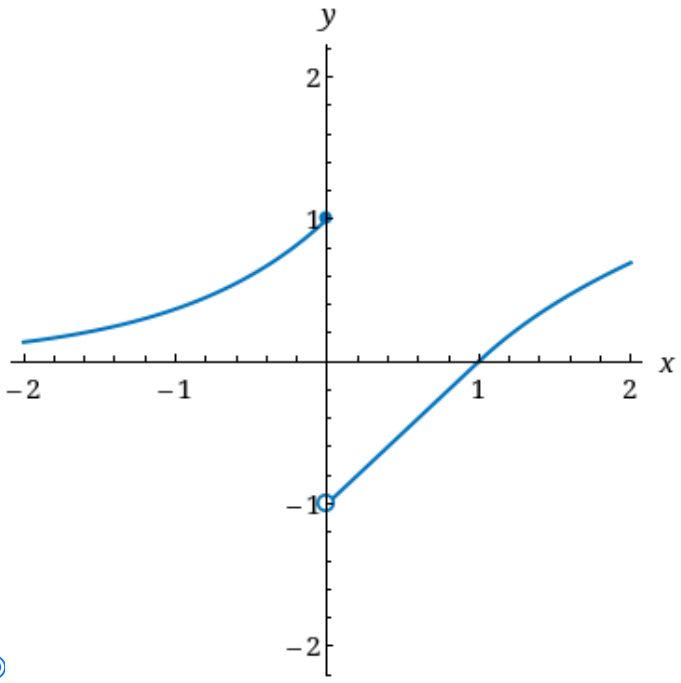
PRACTICE ANOTHER

SCalcET9 2.2.011.

Sketch the graph of the function.

$$f(x) = \begin{cases} e^x & \text{if } x \le 0 \\ x - 1 & \text{if } 0 < x < 1 \\ \ln(x) & \text{if } x \ge 1 \end{cases}$$


y
2
1
−2
−1
1
2
x
−1
−2


y
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−2
−1
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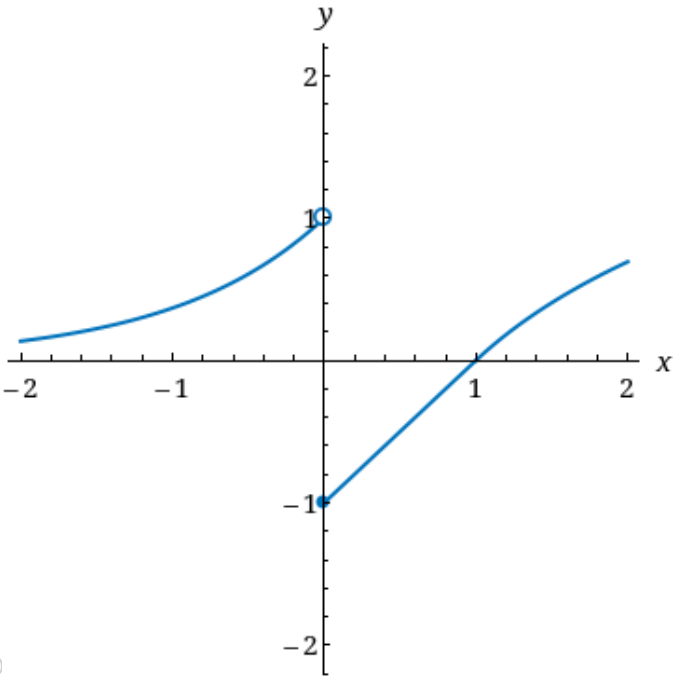
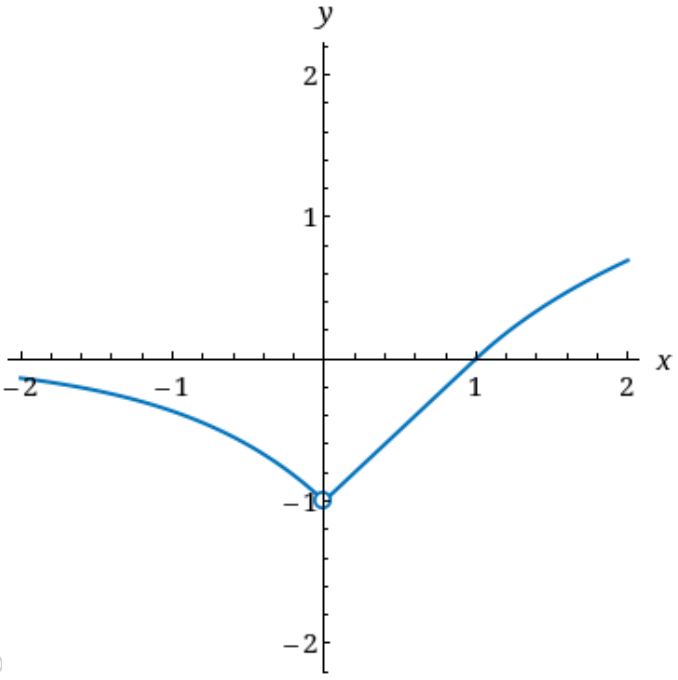
2
x
−1
−2





✔ Amazing job!

Use the graph to determine the values of a for which $\lim_{x \to a} f(x)$ exists. (Enter your answer using interval notation.)

$$(−∞,0)∪(0,∞)

✔ Nice job!

Resources

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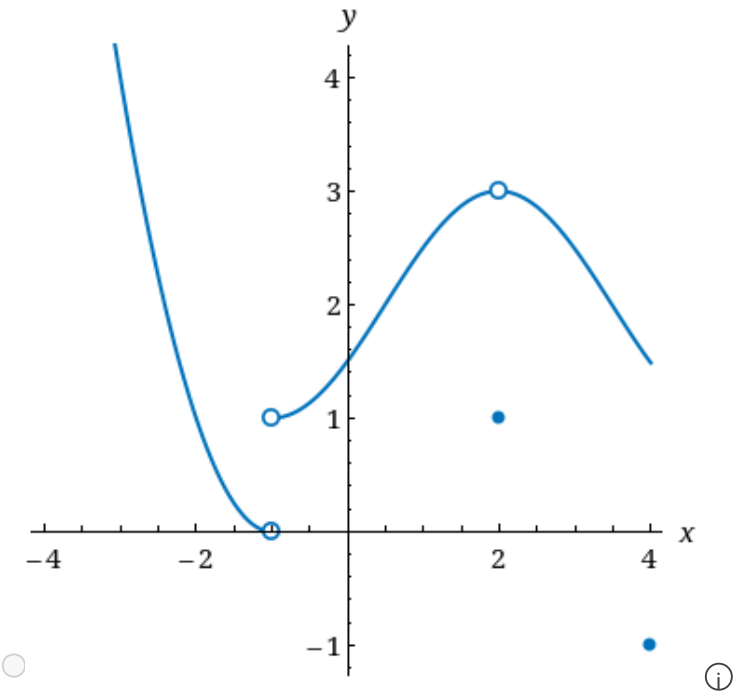
7. **[0.5 / 0.5 Points]**

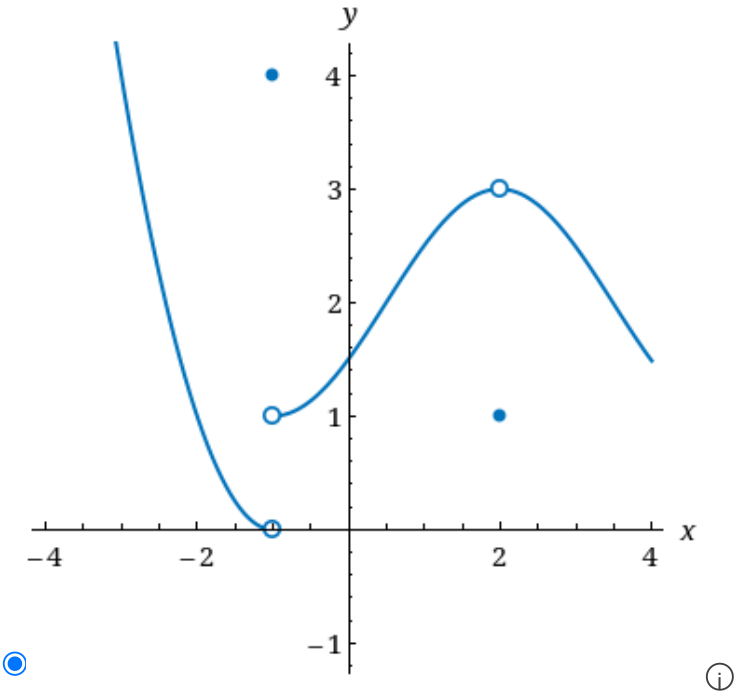
DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

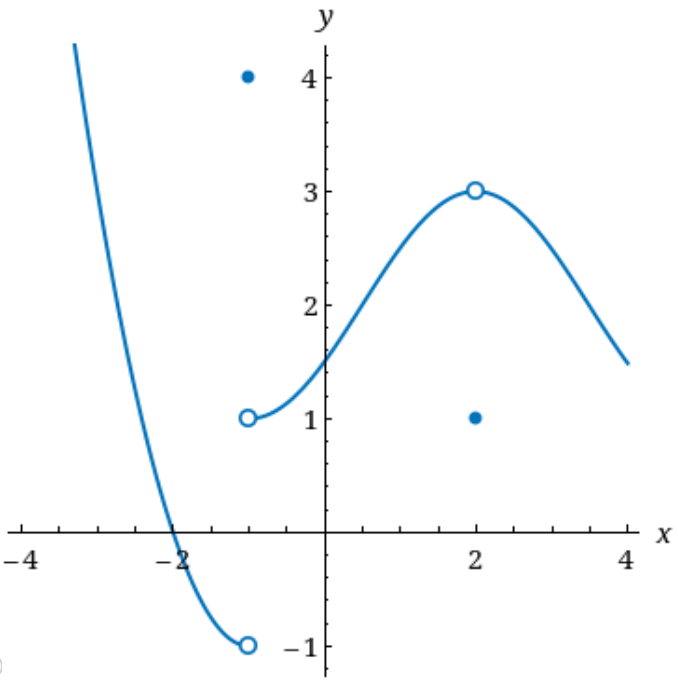
SCalcET9 2.2.017.

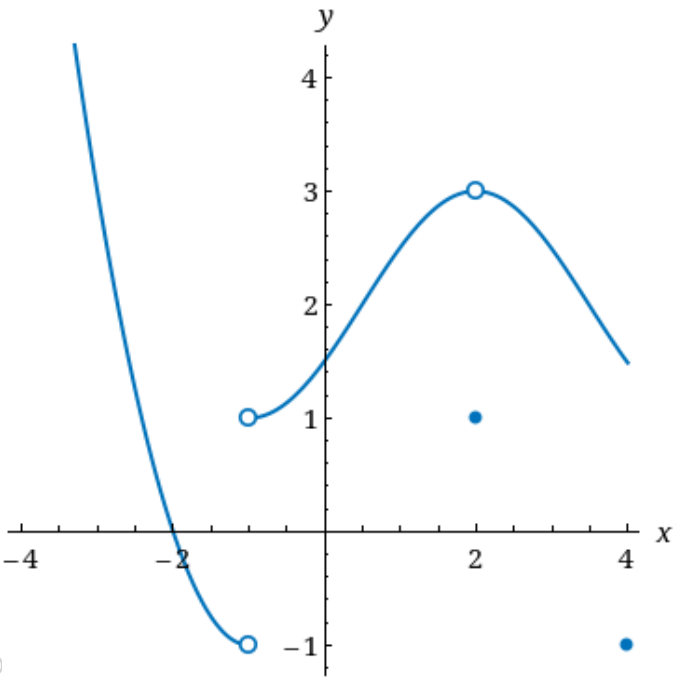
Sketch the graph of an example of a function f that satisfies all of the given conditions.

$$\lim_{x \to -1^-} f(x) = 0, \quad \lim_{x \to -1^+} f(x) = 1, \quad \lim_{x \to 2} f(x) = 3, \quad f(-1) = 4, \quad f(2) = 1$$









✔ Impressive work.

Resources

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8. **[3.5 / 3.5 Points]**

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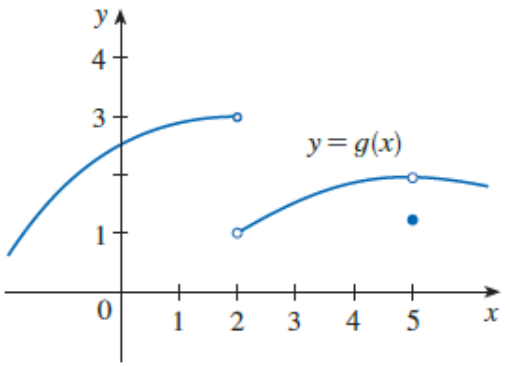
SCalcET9 2.2.AE.004.

Example 4

Video Example

The graph of a function g is shown.



Use it to state the values (if they exist) of the following:

(a) $\lim_{x \to 2^-} g(x)$

(b) $\lim_{x \to 2^+} g(x)$

(c) $\lim_{x \to 2} g(x)$

(d) $\lim_{x \to 5^-} g(x)$

(e) $\lim_{x \to 5^+} g(x)$

(f) $\lim_{x \to 5} g(x)$

Solution

Looking at the graph we see that the values of $g(x)$ approach $\boxed{3}$ ✔ as x approaches 2 from the left, but they approach $\boxed{1}$ ✔ as x approaches 2 from the right.

Therefore (a) $\lim_{x \to 2^-} g(x) = \boxed{3}$ ✔ and (b) $\lim_{x \to 2^+} g(x) = \boxed{1}$ ✔ .

Since the left and right limits are different, we conclude that (c) the limit as x approaches 2 of $g(x)$ does not exist.

The graph also shows that (d) $\lim_{x \to 5^-} g(x) =$ 2 ✔ and (e) $\lim_{x \to 5^+} g(x) =$ 2 ✔ .

This time, the left and right limits are the same and so, by this theorem, we have (f) $\lim_{x \to 5} g(x) =$ 2 ✔ Great work.

Despite this fact, notice that $g(5) \neq 2$.

Resources

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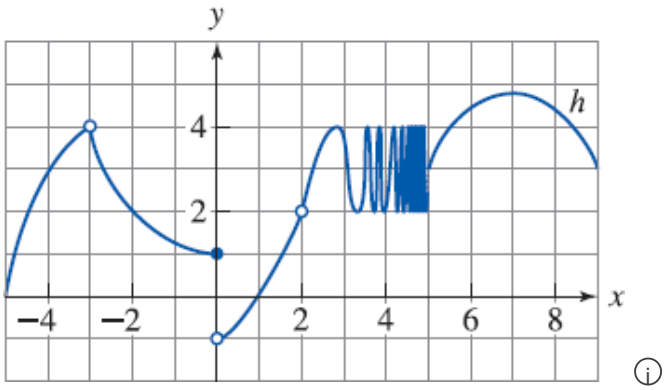
9. **[6 / 6 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 2.2.006.

For the function h whose graph is given, state the value of each quantity, if it exists. (If an answer does not exist, enter DNE.)



(a) $\lim_{x \to -3^-} h(x)$

4 ✓ Great!

(b) $\lim_{x \to -3^+} h(x)$

4 ✓ Impressive work.

(c) $\lim_{x \to -3} h(x)$

4 ✓ Awesome!

(d) $h(-3)$

DNE ✓ Amazing job!

(e) $\lim_{x \to 0^-} h(x)$

1 ✓ Awesome!

(f) $\lim_{x \to 0^+} h(x)$

-1 ✓ Nicely done!

(g) $\lim_{x \to 0} h(x)$

DNE ✓ You're right!

(h) $h(0)$

1 ✓ Nice work.

(i) $\lim_{x \to 2} h(x)$

2 ✔ Amazing job!

(j) $h(2)$

DNE ✔ Good work.

(k) $\lim_{x \to 5^+} h(x)$

3 ✔ That's it!

(l) $\lim_{x \to 5^-} h(x)$

DNE ✔ Good job.

Resources

Read It

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