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1. Level curves

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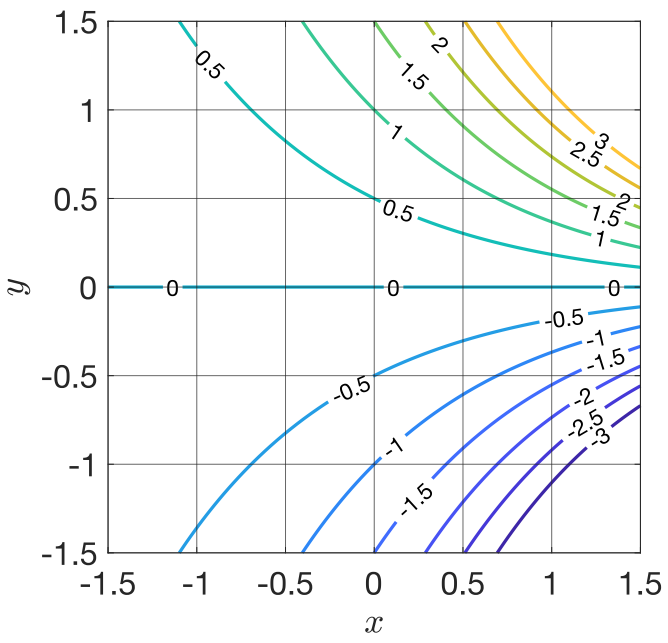
Problem Set A due Aug 4, 2021 20:30 IST Completed

1A-1

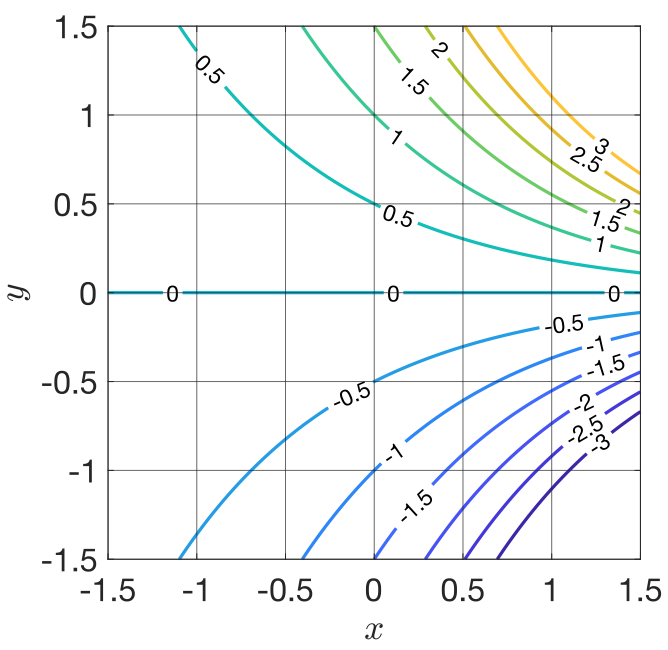
4/4 points (graded)

Consider the level curves of a function $f(x, y)$ shown below.



Answer the following questions based on the level curves above.

Is $f_x(0, 1)$ positive, negative, or zero?



- (●) positive
- ( ) negative
- ( ) zero

✔

Is $f_x(0, -1)$ positive, negative, or zero?

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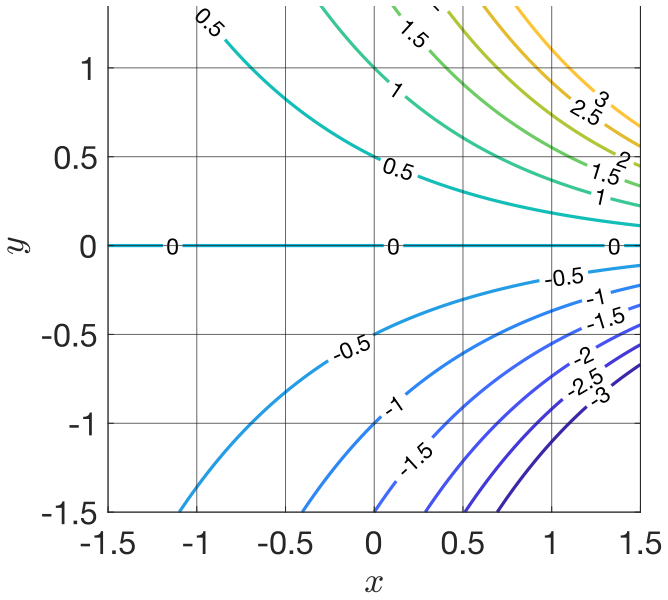
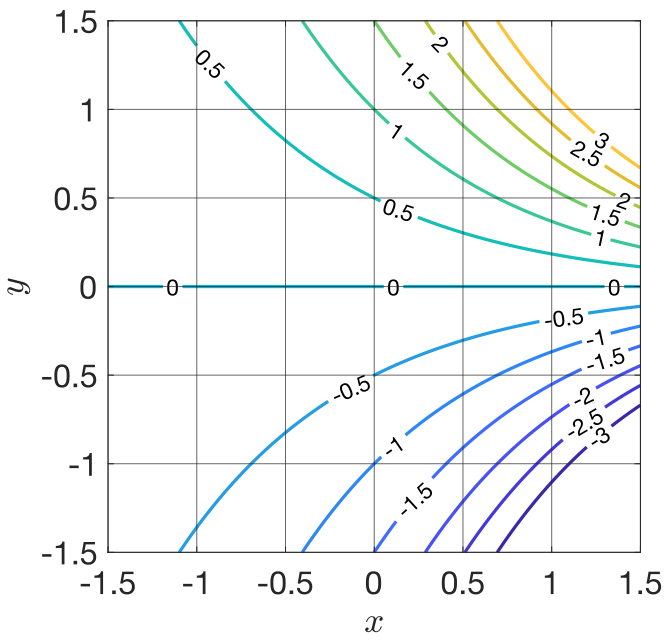


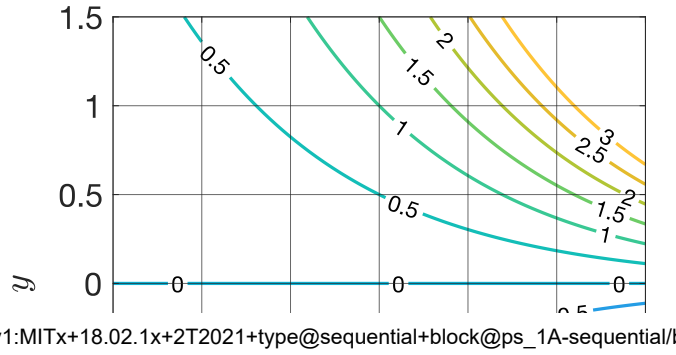
- positive
- negative
- zero

Consider the values $f_y\,(0,0)$ and $f_y\,(1,0)$. Which of the following is true? Choose the best option.



- $f_y\,(0,0) > f_y\,(1,0)$
- $f_y\,(0,0) < f_y\,(1,0)$
- $f_y\,(0,0) = f_y\,(1,0)$

What is the approximate value of $f_y\,(1,0)$?



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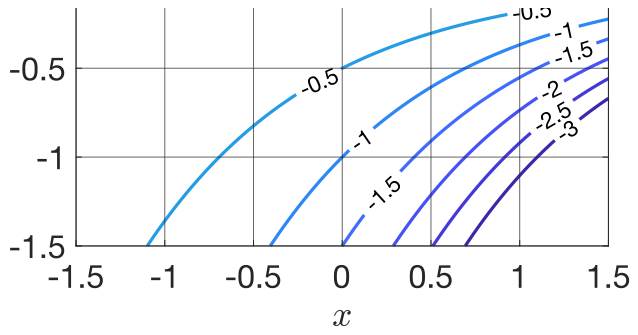

- $f_y\,(1,0) \approx 1$
- $f_y\,(1,0) \approx 2$
- $f_y\,(1,0) \approx 1/2$

✔

Solution:

If we start at the point $(0,1)$ and move in the positive x direction, we are moving from the level curve of height 1 towards the level curve of height 1.5. Therefore, $f_x\,(0,1)$ is positive.

If we start at the point $(0,-1)$ and move in the positive x direction, we are moving from the level curve of height -1 towards the level curve of height -1.5. Therefore, $f_x\,(0,-1)$ is negative.

The level curves at $(1,0)$ are closer together when moving in the positive y direction compared to the level curves at $(0,0)$ when moving in the positive y direction. Therefore, $f_y\,(0,0) < f_y\,(1,0)$.

If we start at $(1,0)$, we are on the level curve of height 0. If we move up to the level curve of height 0.5, we move approximately 0.25 units in the y direction. So the slope in the y direction is approximately $\text{rise}/\text{run} \approx 0.5/0.25 = 2$. Note that in this case, the "rise" is the change in the heights of the level curves and the run is the change in the y-values.

Submit You have used 3 of 2 attempts

Answers are displayed within the problem

1. Level curves

Topic: Unit 1: Functions of two variables / 1. Level curves

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? [STAFF] Extension request — 3
Hello dear teachers, Could you give me an extension for previous past due units since i joined the course late thank you

Deadline extension to August 4th 2021 — 7
I was wondering if the deadline extension to August 4th will be reflected on the website...

You have used 1 of 2 attempts. Not able to have another attempt — 2
Hello Staff, I wanted to resubmit my answers, but I am not able submit the answer again for some reason... Many thanks.

Ohh man! — 2
The submit button was greyed out before 11.

Plz correct — 4
8 attempts and 3 options. You need to be supper smart to get it done))))

? [STAFF] Deadline extension?
Hi Staff, I'm also enrolled on your Calculus 1A course. I noticed there that you have been flexible with dead

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? Deadlines
Could anyone please help me clarify the time of the deadlines? It says 10:00 CDT on my end. Is it the 24 hour clock, translating to 10... 6

☑ clarification 3

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