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6. Level curves practice

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Lecture due Aug 4, 2021 20:30 IST Completed

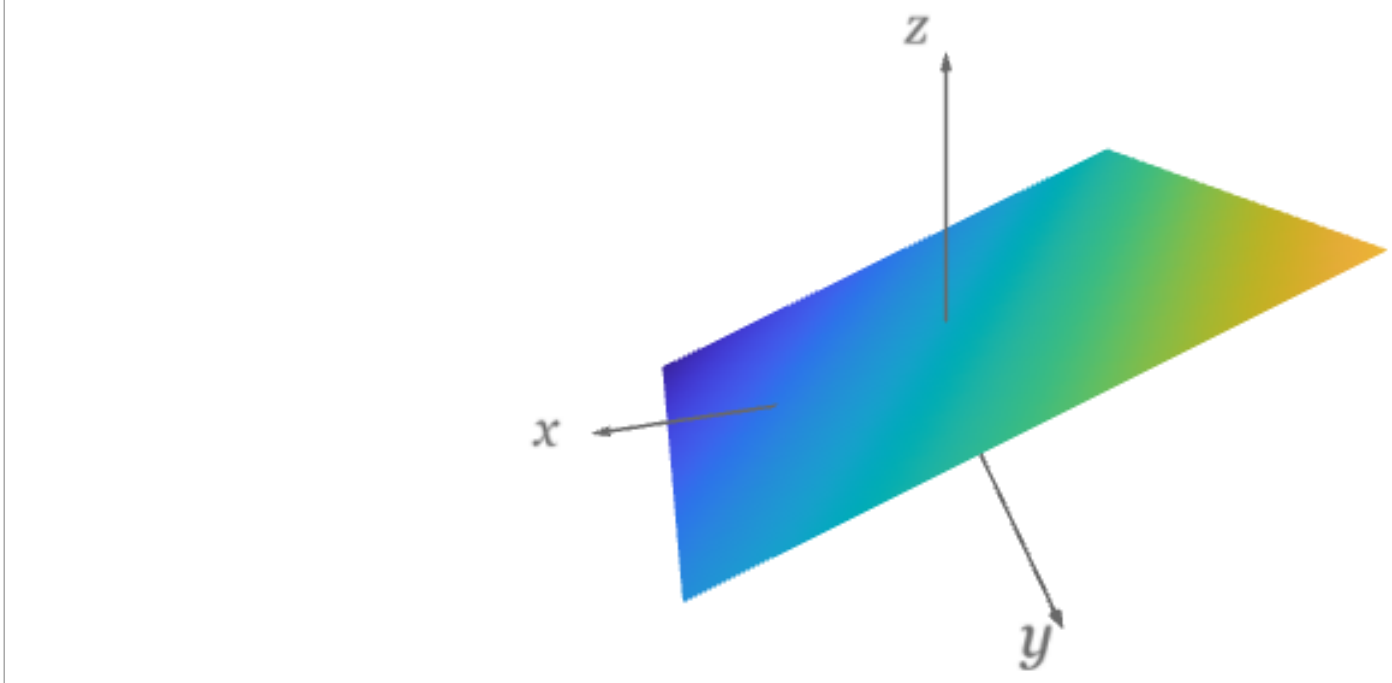
Practice

Level curves practice 1

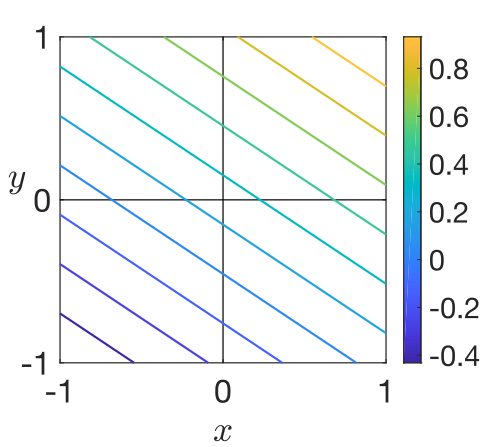
1/1 point (graded)

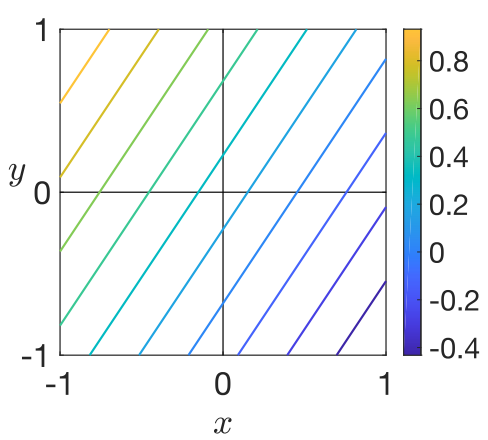
Consider the graph of the plane defined by the equations $z = 1/4 - x/2 + y/3$ shown as an interactive graph below.

▶ A plane



Which of the following best represents the level curves of the graph above? (Hint: Try rotating dragging and rotating the plane above so that it has the same orientation as the level curve plots below.)





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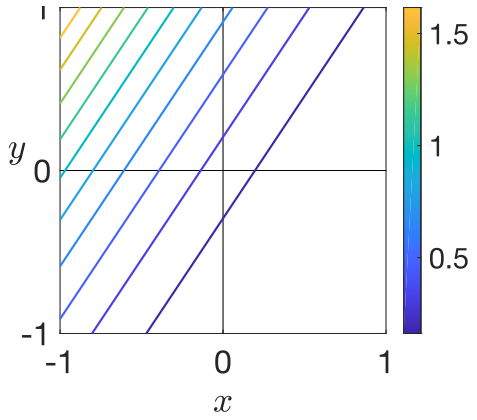


None of the above

✔

Solution:

We can rotate the graph above so that it is oriented such that the positive z-axis points towards you, the positive y-axis points upwards, and the positive x-axis points to the right. With such a view one can see that the second option is correct.

Mathematically, one compute the equations for the level curve of height k

$$k = 1/4 - x/2 + y/3 \tag{2.6}$$
$$y = 3\,(x/2 + k - 1/4) \tag{2.7}$$

These are lines of positive slope $3/2$, which will be evenly spaced for evenly spaced values of k, thus the second option is the correct choice.

Submit You have used 2 of 3 attempts

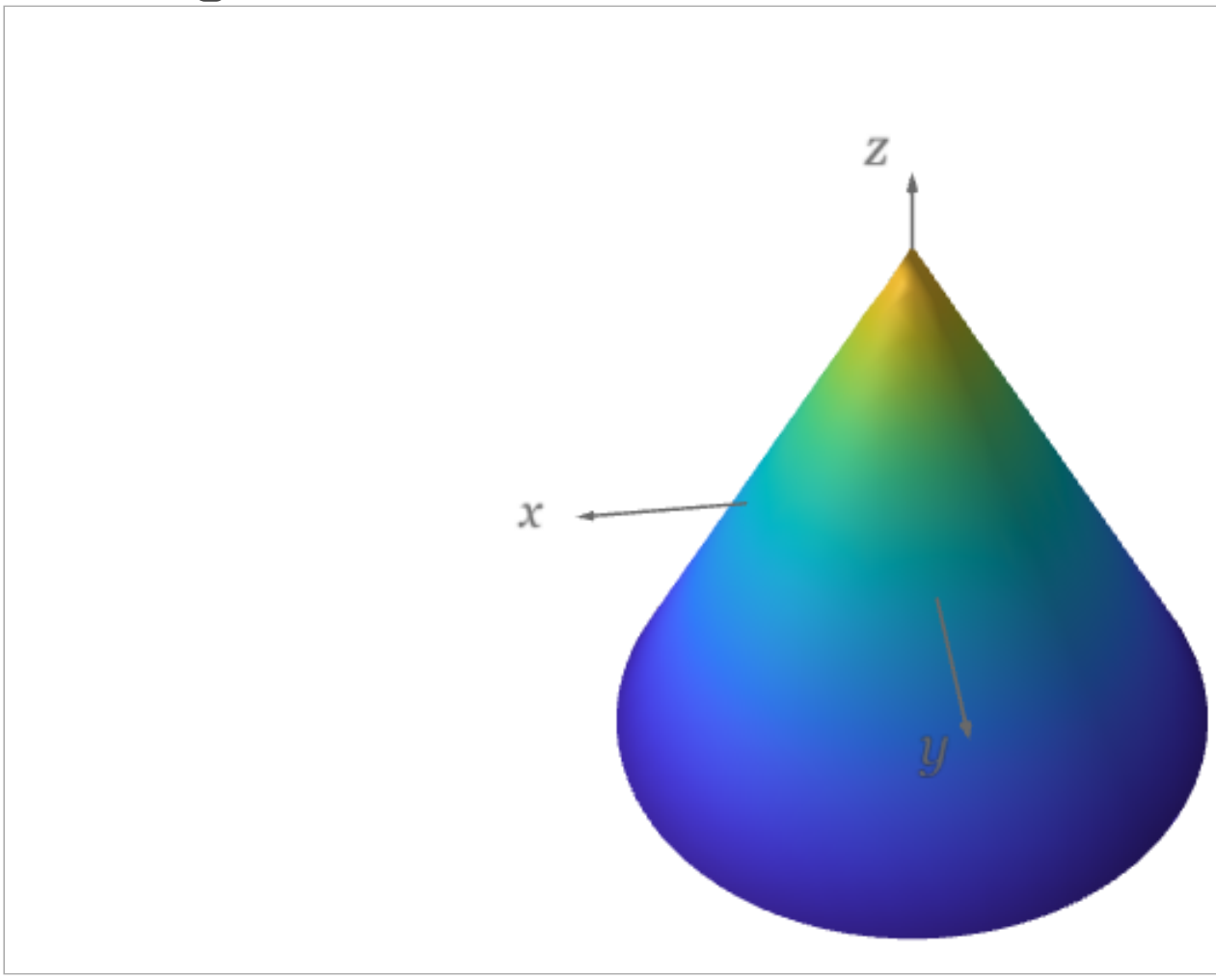
Answers are displayed within the problem

Level curves practice 2

1/1 point (graded)

Consider the graph of the cone $z = 1 - 2\sqrt{x^2 + y^2}$ shown as an interactive graph below.

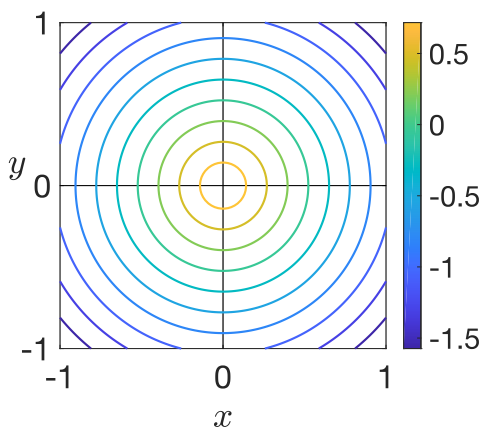
▶ A cone

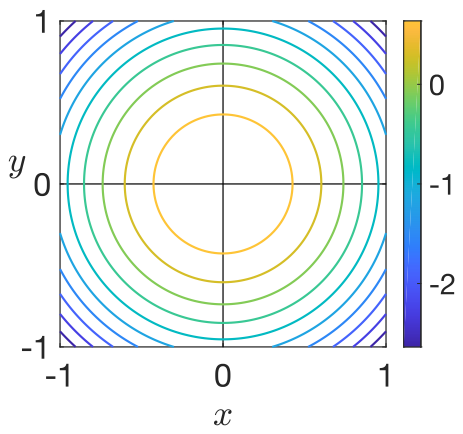


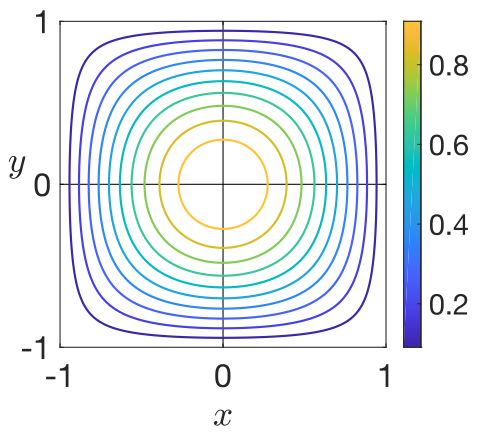
Which of the following best represents the level curves of the graph above?

Calculator Hide Notes

Which of the following best represents the level curves of the graph above?







None of the above

✔

Solution:

Slicing through the cone at even intervals, we get circles of evenly spaced radii. Thus the first option is correct.

The second option is the contour plot of the paraboloid we saw earlier.

The third option is the contour plot of the function $z = \cos(\pi x/2)\cos(\pi y/2)$.

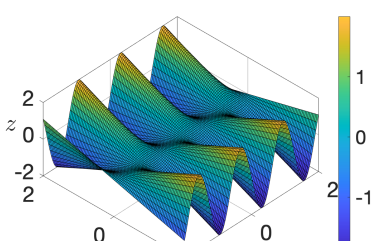
Submit You have used 1 of 3 attempts

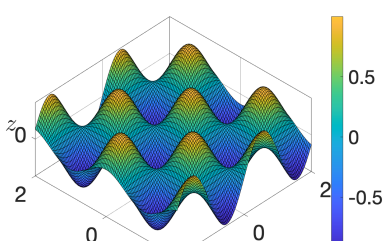
Answers are displayed within the problem

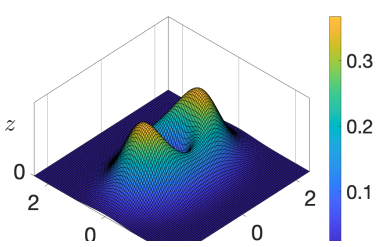
Level curves challenge problem

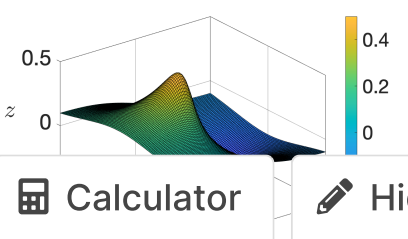
4/4 points (graded)

Consider the surfaces below, which are labeled A, B, C, and D.









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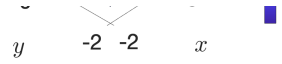
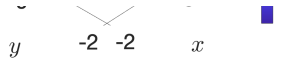
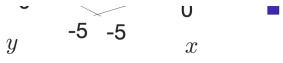


A



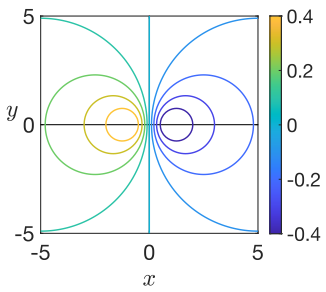
B

C



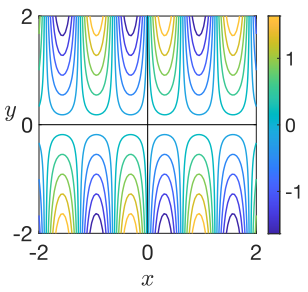
D

Enter the letter below each of the following level curves that corresponds to the surface above.



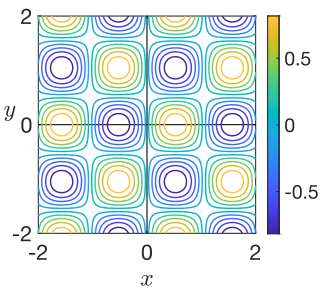
D ✔

Answer: D



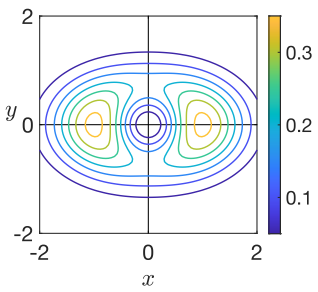
A ✔

Answer: A



B ✔

Answer: B



C ✔

Answer: C

Submit You have used 2 of 3 attempts

Answers are displayed within the problem

6. Level curves practice

Topic: Unit 1: Functions of two variables / 6. Level curves practice

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- [STAFF] answer for Level curves practice 2 — 4
  I selected answer #1, and it was WRONG. The answer #3 is obviously incorrect to me and so I selected #2, which is WRONG again. L...
- Sinusoidal surface in architecture — 5
- How can one decide if the contour plot would generate evenly spaced level curves for evenly spaced values of k? — 3
- This is incredible! — 3
  Jen and the course team, I am amazed by the quality of the work you've done on this course!
- Practice 1 Solution section--syntax and simplicity — 2
  First off, I think there's some stressed syntax in paragraph 2 of the solution. Missing a word?? Second, the intent, I believe, is to use ...
- Drawing Contour Lines in Python — 7
  I found this link very helpful for accomplishing the task of drawing contour graphs in Python. Sharing for anyone else who may be int...
- Although the challenge problem was not hard, it has a hint that is not knowledge related — 2
  If you look at the bars of graphs in answer options, you may find corresponding graphs. Therefore, it is possible to answer correctly ...

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