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3. Practice Exam

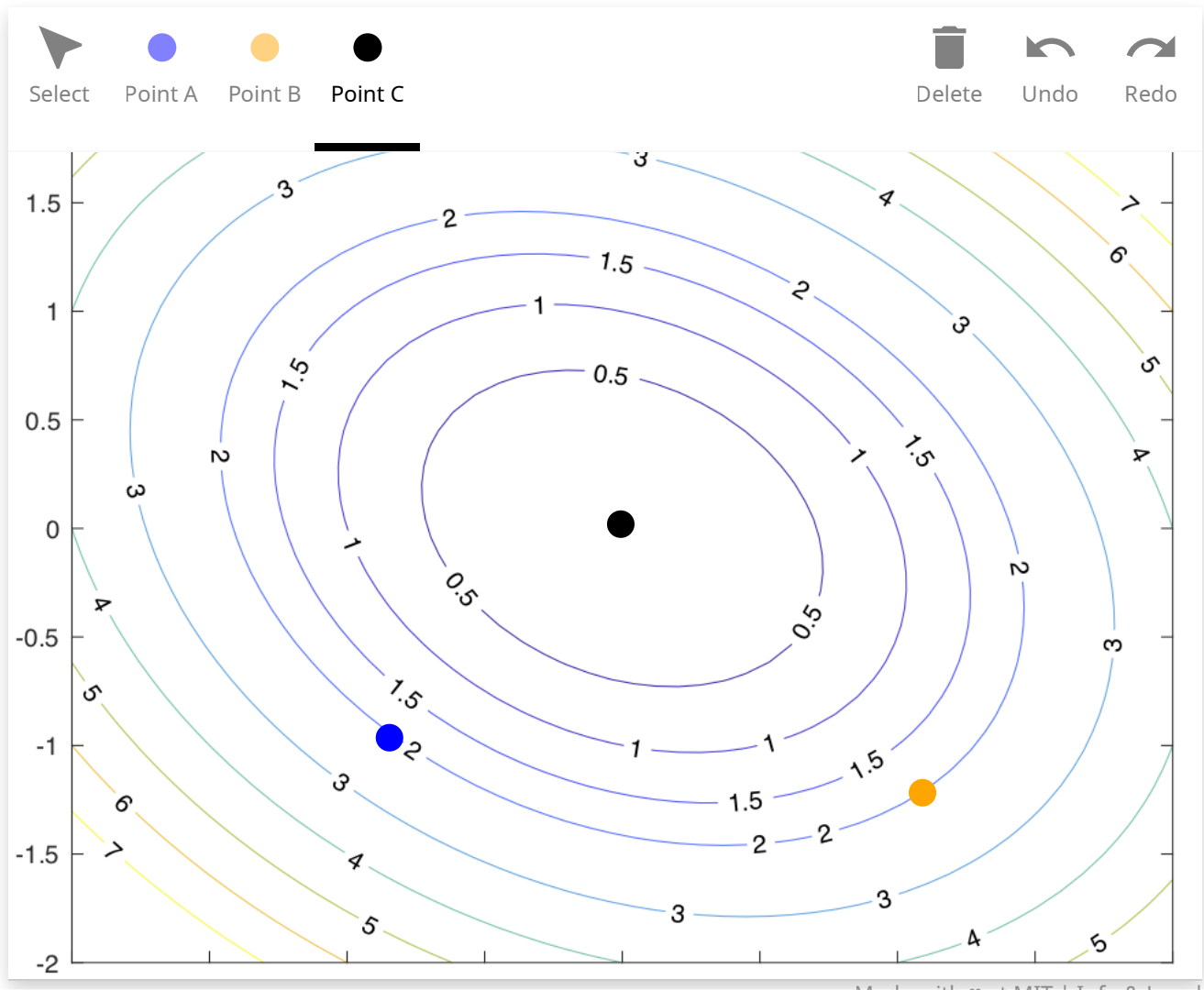
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1.0/1 point (ungraded)

Below is a picture of the level curves of a function  $f(x, y)$ .

- 1. Find a point where  $f_x(x, y) < 0$  and  $f_y(x, y) < 0$ . Label a point in the picture using the **Point A** tool.
- 2. Find a point where  $f_x(x, y) > 0$  and  $f_y(x, y) < 0$ . Label a point in the picture using the **Point B** tool.
- 3. Find a point where  $f_y(x, y) = 0$ . Label a point in the picture using the **Point C** tool.



**Answer:** See solution.

Well done

**Solution:**

- 1. Both the  $x$ - and  $y$ - components of  $\nabla f$  are negative; we are looking for a point where the gradient points any direction between south and west. Recall the gradient is perpendicular to the level curves, and points towards the direction of higher level curves. For example,  $(-1, -1)$  is such a point. (For this question, any point  $(x, y)$  satisfying  $4x + y < 0$  and  $x + 4y < 0$  works.)
- 2. We are looking for a point where the gradient points any direction between south and east;  $(1, -1)$  works. (For this question, any point  $(x, y)$  satisfying  $4x + y > 0$  and  $x + 4y < 0$  works.)
- 3. We are looking for a point where the  $y$ -component of gradient is zero, so that the gradient is horizontal. That means that the tangent line to the curve must be vertical. For example,  $(1, -0.25)$  is such a point. (For this question, any point  $(x, y)$  satisfying  $x + 4y = 0$  works.)

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Answers are displayed within the problem

Calculator

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? [Staff] grader not checking point C

I believe that the grader is not checking if the point C is in the correct position. No matter where I put in on the map, it always gets m...

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