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9. Comparing approximation and function graphically

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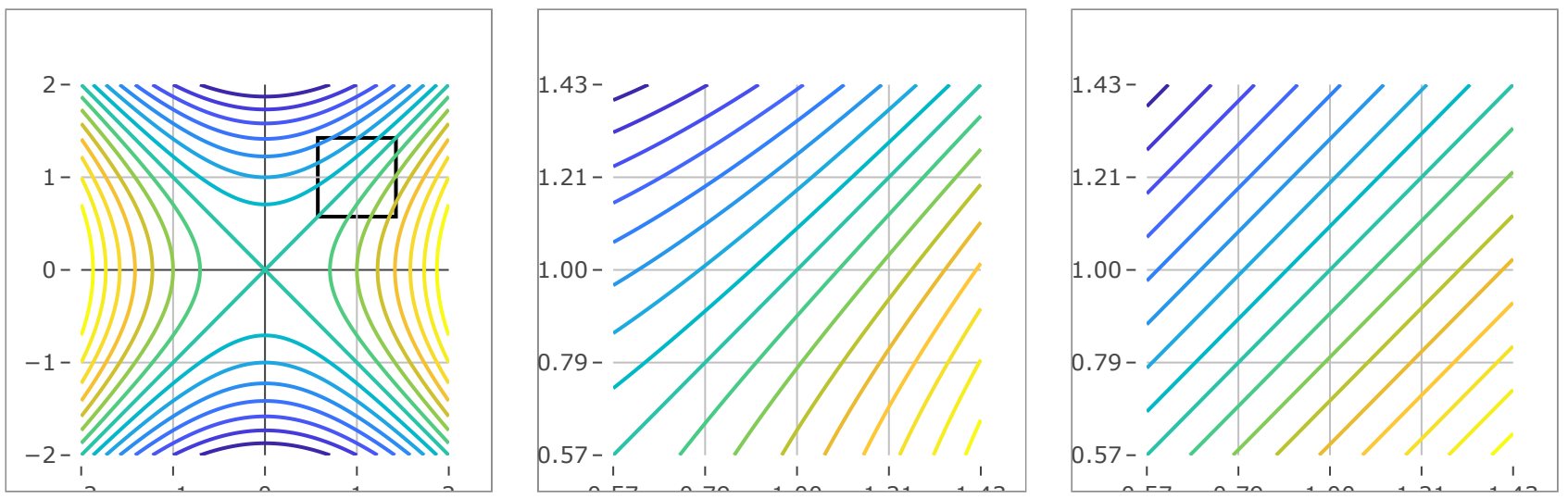
In the following applet, you can compare the function $h(x,y) = x^2 - y^2$ and its linear approximation. Zoom in and you will see both the function and approximation zoom. Note that as you zoom in farther, the two images become indistinguishable! This is what it means to be a good approximation in a region near the point.

1. First, click anywhere on the first image. This sets the point at which we compute the linear approximation.
2. The second image is a copy of the level curves of $h(x,y)$ zoomed in on the square indicated in the leftmost image. The third image is the level curves of the linear approximation for $h(x,y)$ near the point you selected in the leftmost image.
3. Use the Square Size slider to zoom into a neighborhood around the selected point. Compare what happens to the second and third images as you zoom further in.
4. Try selecting other points in the first image at which to compare the function and its linear approximation.
5. Use the equation dropdown menu to test the linear approximation with other functions!

▸ **2D Linear Approximation**

Equation 1 $z = f(x,y) = x^2 - y^2$



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(Use a one star to five star rating scale.)

RESULTS

☆	0%
☆ ☆	1%
☆ ☆ ☆	5%
☆ ☆ ☆ ☆	17%
☆ ☆ ☆ ☆ ☆	77%

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FEEDBACK
Your response has been recorded

9. Comparing approximation and function graphically

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Topic: Unit 1: Functions of two variables / 9. Comparing approximation and function graphically

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- Do level curves of the linear approximation (third image) does not exist at the dead center of function 1, 2, 3, and 4? — 4
  For equations 1, 2, 3, and 4, I tried selecting the dead center (x=0.00, y=0.00, z=0.00) as my point, but nothing came up in the image...
- Loved it — 2
  It's one thing to hear and read "A zoomed in contour plot looks like its linear approximation" and then watching it happen right before...
- mathlet: There should be the same number of lines — 5
  I think it would be better if there were the same number of level curves for both the function and the approximation to be shown.
- Level curves at a minimum or maximum — 3
  If we center the box at a local minimum or maximum, the level curves of the function do not appear to be well approximated by the t...
- [Staff] Minor Correction — 2
  > *Compare what happens to the second and third images and you zoom further in.* I'm guessing that's meant to be what happens ...
- Typo — 2
  "This is what **is** means to be a good approximation in a region near the point."
- Browser issue? —

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