MITx 18.02.1x
Multivariable Calculus 1: Vectors and Derivatives

Help

sandipan_dey ⌄

Course   Progress   Dates   Calendar   Discussion   Notes

🏠 Course / Unit 1: Functions of two vari... / Lecture 3: Visualizing surfaces in three dime...

🕐

You are taking "Exam (Timed, No Correctness Feedback)" as a timed exam. Show more

End My Exam   44:35:41   🚫

‹ Previous   Next ›

5. Method of slicing

🔖 Bookmark this page

Calculator   ✏️ Hide Notes

Lecture due Aug 4, 2021 20:30 IST   Completed

Summarize

In order to visualize the three dimensional graph of a surface $z = f\left(x, y\right)$, we can use the method of slicing described in the example on the previous page.

1. Find the intersection of the xz-plane with the graph of your surface.

   - Geometrically, this is the intersection of the plane $y = 0$ with the graph of the surface $z = f\left(x, y\right)$.

   - Algebraically, this is the curve in the xz-plane defined by the function $z = f\left(x, 0\right)$.

2. Find the intersection of the yz-plane with the graph of your surface.

   - Geometrically, this is the intersection of the plane $x = 0$ with the graph of the surface $z = f\left(x, y\right)$.

   - Algebraically, this is the curve in the yz-plane defined by the function $z = f\left(0, y\right)$.

3. Find the intersection of the xy-plane with the graph of your surface.

   - Geometrically, this is the intersection of the plane $z = 0$ with the graph of the surface $z = f\left(x, y\right)$.

   - Algebraically, this is the curve on the xy-plane defined implicitly by the equation $0 = f\left(x, y\right)$.

Note that you can extend this procedure by intersecting with other planes, for example planes parallel to the yz-plane such as the planes defined by the equations $x = 1$ and $x = -1$.

To better visualize slicing a surface with different planes, you can explore different slices using the mathlet below. Click on the title for an expanded help menu.

▶ **Slicing** 👆

Equation 1 ∨ $z = f(x, y) = (x^2 + y^2) + 0.5x - 0.25(x^2 + y^2)^2$

⊞ Calculator   ✎ Hide Notes
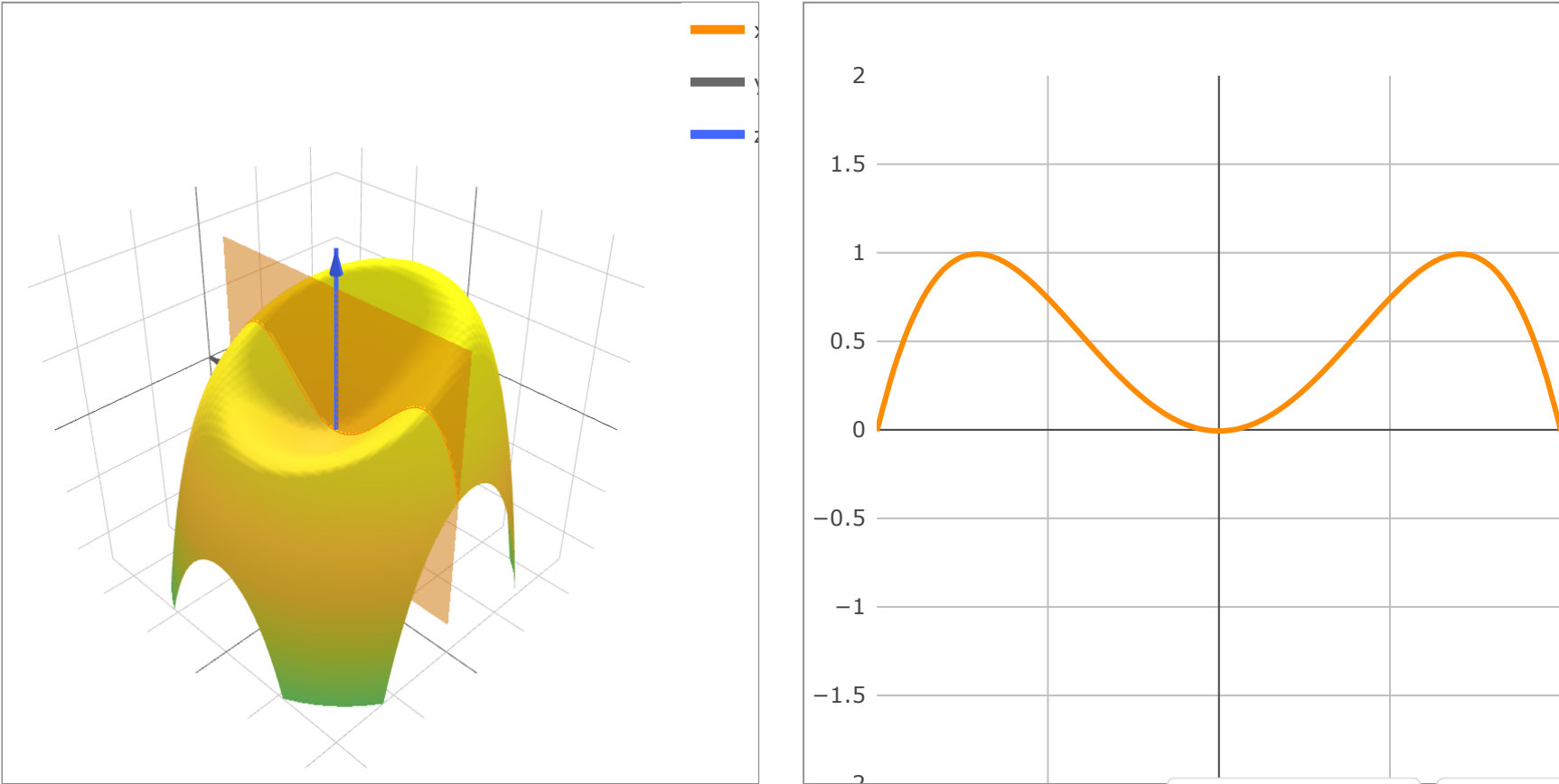
c   -0.014

☐ 3D labels   ☐ 3D zoom

PLEASE RATE THIS MATHLET
(Use a one star to five star rating scale.)

RESULTS

○	☆		**0%**
○	☆ ☆		**1%**
○	☆ ☆ ☆		**3%**
○	☆ ☆ ☆ ☆		**11%**
◉	☆ ☆ ☆ ☆ ☆		**85%**

Submit

Results gathered from 558 respondents.

FEEDBACK
Your response has been recorded

Connecting algebra and geometry 1

1/1 point (graded)
Which of the following functions best describes the intersection of the plane $x = 1$ and the surface $z = f(x, y)$.

◉ $z = f(1, y)$

○ $z = f(x, 1)$

○ $z = f(x, x)$

○ None of the above.

✔

Submit   You have used 1 of 1 attempt

Connecting algebra and geometry 2

1/1 point (graded)
Which of the following functions best describes the intersection of the plane $x = y$ and the surface $z = f(x, y)$.

○ $z = f(1, y)$

○ $z = f(x, 1)$

◉ $z = f(x, x)$

○ None of the above.

✔

▦ Calculator   ✎ Hide Notes

Submit   You have used 1 of 1 attempt

---

5. Method of slicing

Topic: Unit 1: Functions of two variables / 5. Method of slicing

Hide Discussion

Add a Post

Show all posts ⌄		by recent activity ⌄
💬 **I wish this was around when I was learning algebra and calculus** While the value of computers may be debatable in many areas of education, I'm completely sold on the value of computer-generate...		3
☑ **MATHLET'S 3D label for x and y** Hello i am playing around the mathlet and i understand z=c is showing the level curve But I dont quite see why x=c and y=c is as sho...		3
? **STAFF -- Connecting algebra and geometry 2 Solution**		3

‹ Previous   Next ›

edX

About

Affiliates

edX for Business

Open edX

Careers

News

Legal

Terms of Service & Honor Code

Privacy Policy

Accessibility Policy

Trademark Policy

Sitemap

Calculator   Hide Notes

Connect

[Blog](#)
[Contact Us](#)
[Help Center](#)
[Media Kit](#)
[Donate](#)

© 2021 edX Inc. All rights reserved.

深圳市恒宇博科技有限公司 [粤ICP备17044299号-2](#)

 Calculator   Hide Notes