

Integrated and interactive web based modules for multivariable calculus

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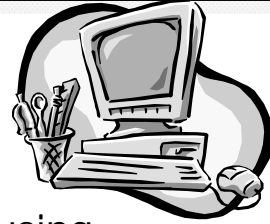
Introduction

- ◆ Modules to enhance instruction in multivariable calculus
- ◆ Fall 2001 evening class at Kean University
- ◆ Students need software access outside of computer labs on campus
- ◆ Web based delivery an obvious choice

Advantages of web based delivery

- ◆ Work at home convenience
- ◆ Use of free plug-in requires no financial investment
- ◆ Ease of navigation provides access to documentation and additional topics
- ◆ Interactive plug-in allows students to examine various scenarios

Using LiveMath



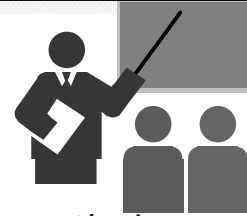
- ◆ Instructor makes modules using LiveMath Maker
- ◆ Modules uploaded to web site
- ◆ Students view them using a free plug-in
- ◆ The viewable modules are interactive
- ◆ Example

Web design issues



- ◆ Use of JavaScript for better navigation controls
- ◆ Provide good navigational structure
- ◆ Side-by-side display of narrative and image
- ◆ Audio clips can be added
- ◆ Pop-up windows explaining terms and concepts can be added

Pedagogical issues



- ◆ Students unlikely to explore on their own unless the activity is graded
- ◆ Narrative guides students to explore as well as answer specific questions
- ◆ In the instructor's course, students were required to hand in the activities with well written explanations

Summary

- ◆ Using LiveMath Maker makes it easy to create interactive, web based modules
- ◆ The modules are useful only when accompanied by a narrative that directs students as to what to look for
- ◆ Elements of good web design can simplify navigation through various topics

Graphs of Surfaces

It is useful to examine graphs of surfaces from various points of view to help you visualize the nature of the surface.

You will need a free plugin from [LiveMath](#) to view and interact with the graph at right.

We will graph the surface described by

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

where a is a parameter that we can change. In this exercise, you will interactively explore the effects of a parameter on the shape of a surface.

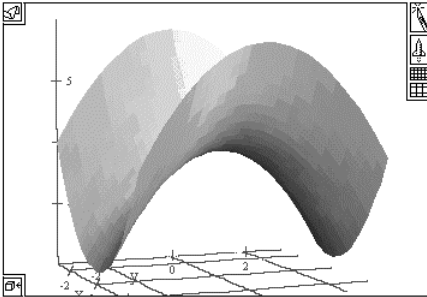
made with **LIVE MATH MAKER** help get free stuff

LIVE MATH NEW NOTEBOOK LITE

DOUBLE-CLICK TO OPEN HELP BELOW

$a = 1$

$z = ax^2 - y^2$



xMin = -3

xMax = 3

yMin = -3

yMax = 3

zMin = -10

zMax = 10

Contact Information

- ◆ Email
 - rnarasim@kean.edu
- ◆ Web site for modules
 - www.collegemath.info
follow link to interactive modules
- ◆ www.livemath.com
For LiveMath information