Enhancing Student Understanding Using On-line Resources
Fall 2010 MATYCONN Meeting
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Why use on-line resources in an on-ground class?

- To provide a visual and motivating introduction to a topic
- Help students visualize a concept
- Easily demonstrate motion through animation
- To add variety to teaching techniques
- To connect students with the vast array of online math resources
- To further engage students in their learning
- Others?

Where do you get these online resources?

- Publisher provided resources

  - Publisher website: Pearson
    http://www.pearsonhighered.com/pearsonhigheredus/educator/profile/ircHomeTab.page?null
  - MyMathLab: http://www.coursecompass.com/
    - Interactive figures for Calculus
      - Related Rates Problems
        - Figure 3.67 Spreading Oil
        - Figure 3.68 Two airplanes approaching a common airport
        - Figure 3.69 Growing pile of sand
    - Online Homework
    - Supplement to course
    - Self-paced mode of instruction

- Applets (a stand alone application):

  - Linear Equations in Two Variables
    - http://mathforum.org/te/exchange/hosted/linearlasers/demonstration.html
      demonstration: overview of information on coordinate system and graphing a
      linear equation

      Prethink: applet provides sliders for the slope and the y-intercept to explore how
      they impact the graph of a line

      Game: adjust the slope and y-intercept to create a line that will hit two given
      points

      Wrap-Up: summary of previous three sections

    - http://home.earthlink.net/~fossmountdesign/Applets/LinearApplet.html applet that
      has you use slope and y-intercept sliders to move one line so that it aligns with
      another line

  - Difference quotient
    - This applet demonstrates what happens to the secant line as h gets smaller and
      smaller (approaches zero). Click link at the bottom of the page that says "Launch
      Presentation" to get a larger view. http://www.calculusapplets.com/derivpoint.html

- o Conic sections
  - • http://mathdemos.gcsu.edu/mathdemos/family_of_functions/conic_gallery.html
    This link includes many animations on the conic sections in general (static picture and animation on generating the conic sections) and then galleries of demonstrations that allow you to see what happens to the graphs as you vary constants or translate the basic graphs.

  - • http://www.cut-the-knot.org/Curriculum/Geometry/EllipseFocal.shtml
    This link lets you demonstrate the geometric definition (focal def.) of the ellipse.

- o Trigonometric graphs
  - ▪ This is an applet that quickly shows the relationship between the y-values of the unit circle and the sine graph:
    http://www.ies.co.jp/math/java/samples/graphSinX.html

  - ▪ This is an applet that allows you to enter a, b, and c for a sine graph and see the transformations:
    http://www.ies.co.jp/math/java/trig/ABCsinX/ABCsinX.html

- o Law of Sines
  - • To launch the applet scroll down toward the bottom of the page. Click on the box. http://www.analyzemath.com/Triangle/SineLaw.html

- • Wikipedia: http://www.wikipedia.org/ This is a great place to start. It offers many helpful links and images.

- • YouTube: http://www.youtube.com/ You have to search, but there are many great short videos.

- • More to come from Andre' on Wolfram's Mathematica

- • Others?

Presentation:

- • PowerPoint Slide Show
  - o Welcome to Calculus
  - o Trigonometry
  - o Polar Equations

- • BlackBoard folders and files
  - o Web links
  - o PowerPoint slide shows

- • Others?

Other Resources recommended at MATYCONN Meeting:

- • www.Merlot.org
- • www.WolframAlpha.com
- • NCTM Illuminations
- • MIT Open Source