Lecture 7: Review

http://www.math.columbia.edu/~dpt/F10/CalcIII/

September 28, 2010
Announcements

- HW 3 due. Pick up HW 2.
  - Remember to explain your answers!
- Midterm on Thursday.
  - You are allowed one handwritten page of notes, both sides. No other aids.
  - Professor Lipshitz will administer.
- No office hours on Wednesday.
Course so far

- Coordinates
  - Measuring distances
  - Cylindrical coordinates
  - Spherical coordinates
  - Vectors
- Dot product
  - Algebraic expression
  - Geometric meaning
  - Using to measure lengths, angles
  - Projection and component
  - Correlation
- Cross product
  - Determinants and volume
  - Algebraic expression
  - Geometric meaning
  - Using to find normal vectors
- Lines and planes
  - Implicit versus parametric equations
  - Parametric equations for lines
  - Implicit equations for planes
  - Angles between lines, planes
  - Intersection of two planes
  - Distance form planes
  - Planar case
  - Etc.
- Quadric surfaces
  - Conic sections
  - Traces
  - Basic types
  - Identifying surfaces
The following equations correspond to the graphs on the next page. Which goes with which?

\[ x^2 + 4y^2 + 4z^2 = 1 \] \[ -x^2 + 4y^2 + z^2 = 1 \]

\[ -x^2 + 4y + z^2 = 1 \] \[ -4x^2 + y - z^2 = 0 \]

\[ 4x^2 + y^2 + z^2 = 1 \] \[ -4x^2 + y^2 - z^2 = 1 \]