

# MA205 Lesson 30

## Lesson 30 - Polar Regions

Monday, October 8, 2007

# Outline

- 1 Admin
- 2 Solution to Problem Solving Lab
  - Solution to Problem Solving Lab
- 3 Polar Coordinates
  - Polar Coordinates
  - New Polar Coordinates Algorithm
- 4 Lesson Link

# Admin

- 1 Quiz 8 - 10 minuets
- 2 Homework 2 is coming
- 3 Project 2 will be issued on Thursday
- 4 Bonus points for completing the problem of the week on the main math web page

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# Solution to Problem Solving Lab

Course Guide Check

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# Polar Coordinates

1  $r^2 = x^2 + y^2$

2  $x = r \cos \theta$

3  $y = r \sin \theta$

4 
$$\iint_R f(x, y) dA = \int_{\alpha}^{\beta} \int_a^b f(r \cos \theta, r \sin \theta) r dr d\theta$$

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# Polar Coordinates

- 1 If possible create a 3D plot of the surface over the region
  - Study diagram to determine if this is positive, negative, or mixed.
  - Establish a very rough idea of the volume of the space
- 2 Draw and Label the Region
- 3 Determine the limits of integration
  - Max and Min radial limits
  - Max and Min angular limits
- 4 Convert the integrand to an equivalent polar expression
- 5 Set up the iterated integral
- 6 Compute/Evaluate the inside integral
- 7 Compute/Evaluate the outside integral
- 8 Look back, does it make sense?

# Parametric Equations

# Questions