

# AP Calculus BC

Unit I Day 3

#### Warmup

Convert the following equations from Polar to Cartesian form. Consult with your partner and think creatively! BE PREPARED to SHARE! Do your work NEATLY.

1.  $r = -4\cos\theta$ 

## 2. $r\sin\theta = \ln r + \ln\cos(\theta)$





1.  $r = -4\cos\theta$ 

 $x^2 + y^2 = -4x$ 

2.  $r \sin \theta = \ln r + \ln \cos(\theta)$  $y = \ln x$ 

Do you know what the graphs of the answers look like??

## Graph of problem #1 ...

1.  $r = -4\cos\theta$ 

$$x^2 + y^2 = -4x$$

Complete the square on the equation.

Then confirm by looking at the polar graph.



## HW Questions?

## Practice converting points

Convert the polar point  $(-1,7\pi)$  to Cartesian coordinates

Convert the Cartesian point  $(-\sqrt{3},-1)$  to polar coordinates

#### Using your calculator for conversions

- From Polar to Cartesian
  - 2<sup>nd</sup> APPS
    - Option 7—Will return the x-coordinate
    - Option 8—Will return the y-coordinate
- Let's Practice with  $(-1,7\pi)$

#### Using your calculator for conversions

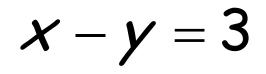
- From Cartesian to Polar
  - 2<sup>nd</sup> APPS
    - Option 5—Will return the r value
    - Option 6—Will return the  $\theta$  value
- Let's Practice with  $(-\sqrt{3},-1)$

NOTE: Be careful because this answer might not be a multiple choice answer!! You should not rely solely on the calculator for these problems!!



### Converting from Cartesian to Polar

**Example Problem:** 



Then confirm by comparing polar graph to what we know the given equation looks like.



#### Example Problem #2:

xy = 2

Then confirm by comparing polar graph to what we know the given equation looks like.



Example Problem #3:

$$x^{2} + (y - 3)^{2} = 9$$

Then confirm by comparing polar graph to what we know the given equation looks like.