

Unit 10 (Chapter 6): Parametric & Polar

6.4 Polar Coordinates

Target 10D: Understand the polar coordinate system by performing polar/rectangular coordinate conversions

Review of Prior Concepts

1. Find the magnitude of the vector $\langle \sqrt{3}, 1 \rangle$. 2. Find the direction angle of the vector $\langle \sqrt{3}, 1 \rangle$.

Polar Coordinates

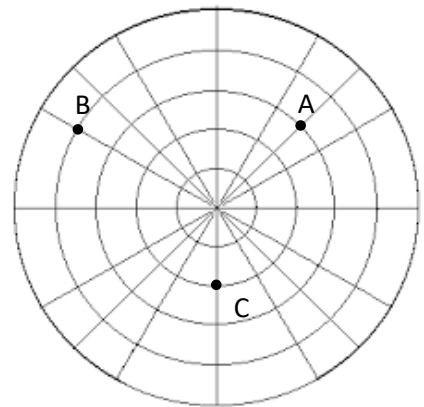
(r, θ)

The polar coordinates of point A is $(3, 45^\circ)$ or $(3, \frac{\pi}{4})$.

Example 1: Identify the coordinates of:

a) point B

b) point C

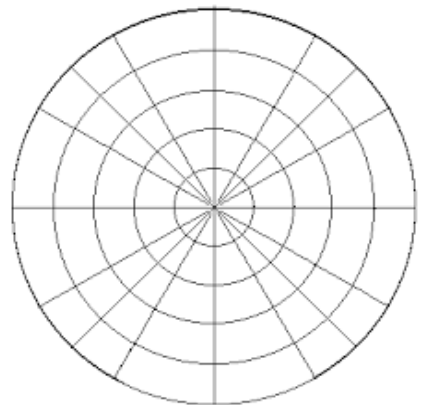


Example 2: Plot each of the given points:

a) D $(5, \pi)$

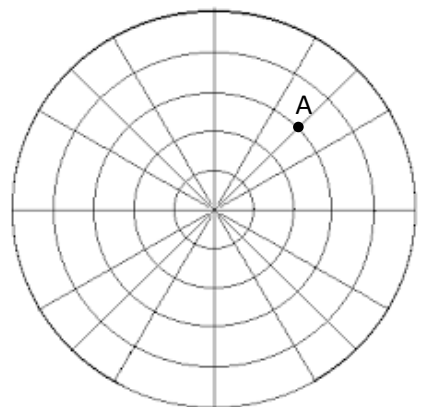
b) E $(-2, \frac{\pi}{3})$

c) F $(3.5, -\frac{\pi}{6})$



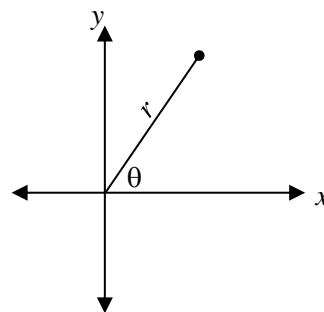
Example 3:

Determine the rectangular (x, y) coordinates of point A.



Convert Polar Coordinates to Rectangular Coordinates

$$(r, \theta) \rightarrow (x, y)$$

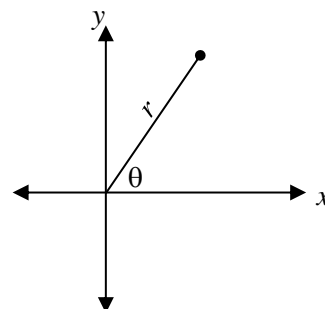


Example 4:

Convert $(2, \frac{5\pi}{6})$ to rectangular coordinates.

Convert Rectangular Coordinates to Polar Coordinates

$$(x, y) \rightarrow (r, \theta)$$



Example 5:

Convert $(3\sqrt{2}, 3\sqrt{2})$ to polar coordinates.

More Practice

Polar Coordinates

http://mathinsight.org/polar_coordinates

<https://www.mathsisfun.com/polar-cartesian-coordinates.html>

[http://math.illinois.edu/~rasekh2/math231\(s2016\)/PolarEquations.pdf](http://math.illinois.edu/~rasekh2/math231(s2016)/PolarEquations.pdf)

<http://tutorial.math.lamar.edu/Classes/CalcII/PolarCoordinates.aspx>

http://www.mathwords.com/p/polar_rectangular_conversion_formulas.htm

<https://youtu.be/r0fv9V9GHdo>

<https://youtu.be/jexMSISDubM>

<https://youtu.be/2RQk9P-EVpQ>

<https://youtu.be/L4v98ZZft68>

Homework Assignment

p.492 #1-7 odd, 13, 15, 21, 27, 29