Math 1432

Bekki George
bekki@math.uh.edu
639 PGH

Office Hours:

Mondays 1-2pm,
Fridays noon-1pm
(also available by appointment)

Class webpage:

http://www.math.uh.edu/~bekki/Math1432.html

Recall $\left|R_n(x)\right| \le \left(max \left| f^{(n+1)}(c) \right| \right) \frac{|x|^{n+1}}{(n+1)!}$ for c between 0 and x.

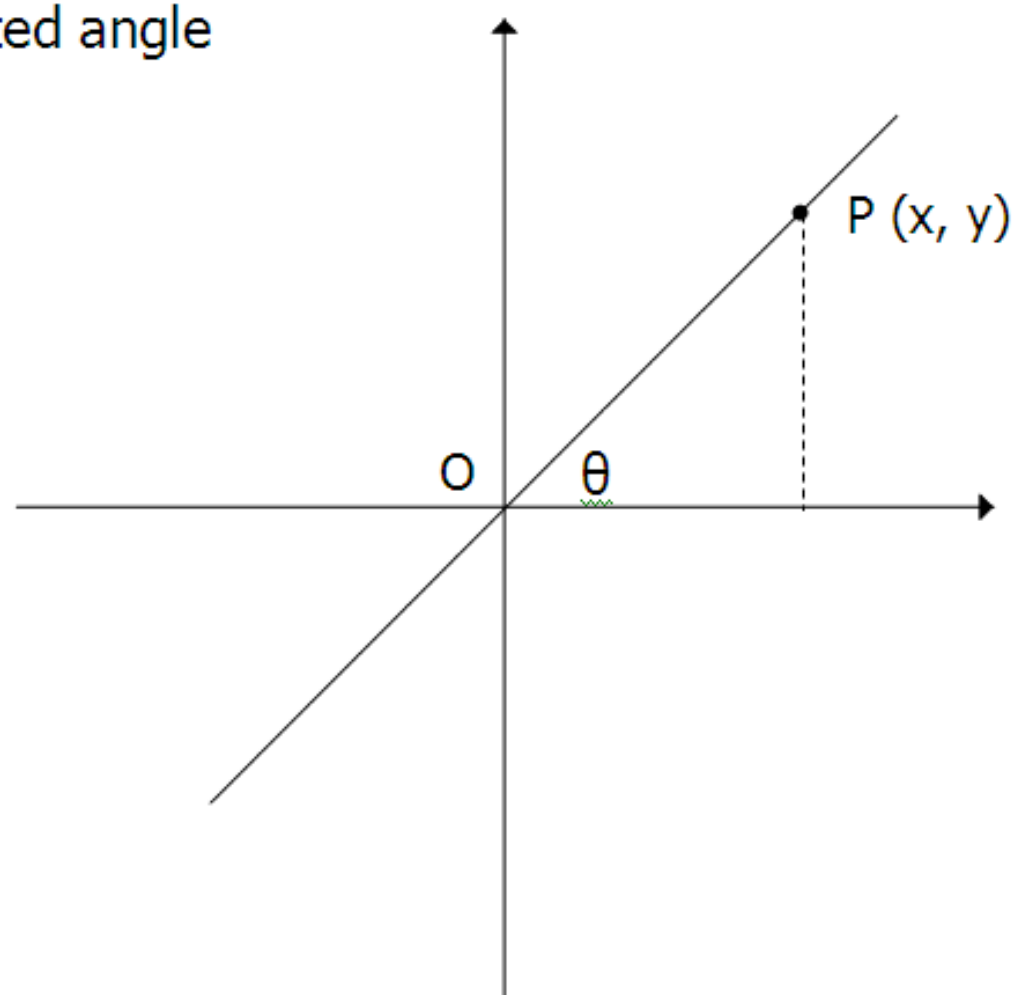
Assume that f is a function such that $\left|f^{(n)}(x)\right| \le 1$ for all n and x. Estimate the error if $P_7(-2)$ is used to approximate $f(-2)$

10.1 Polar Coordinates

How do you describe the position of a point in a plane using distance and angle rather than x- and y-coordinates?

r = directed distance from O to P

θ = directed angle



Plot the points.

A. $\left[2, \frac{\pi}{3}\right]$

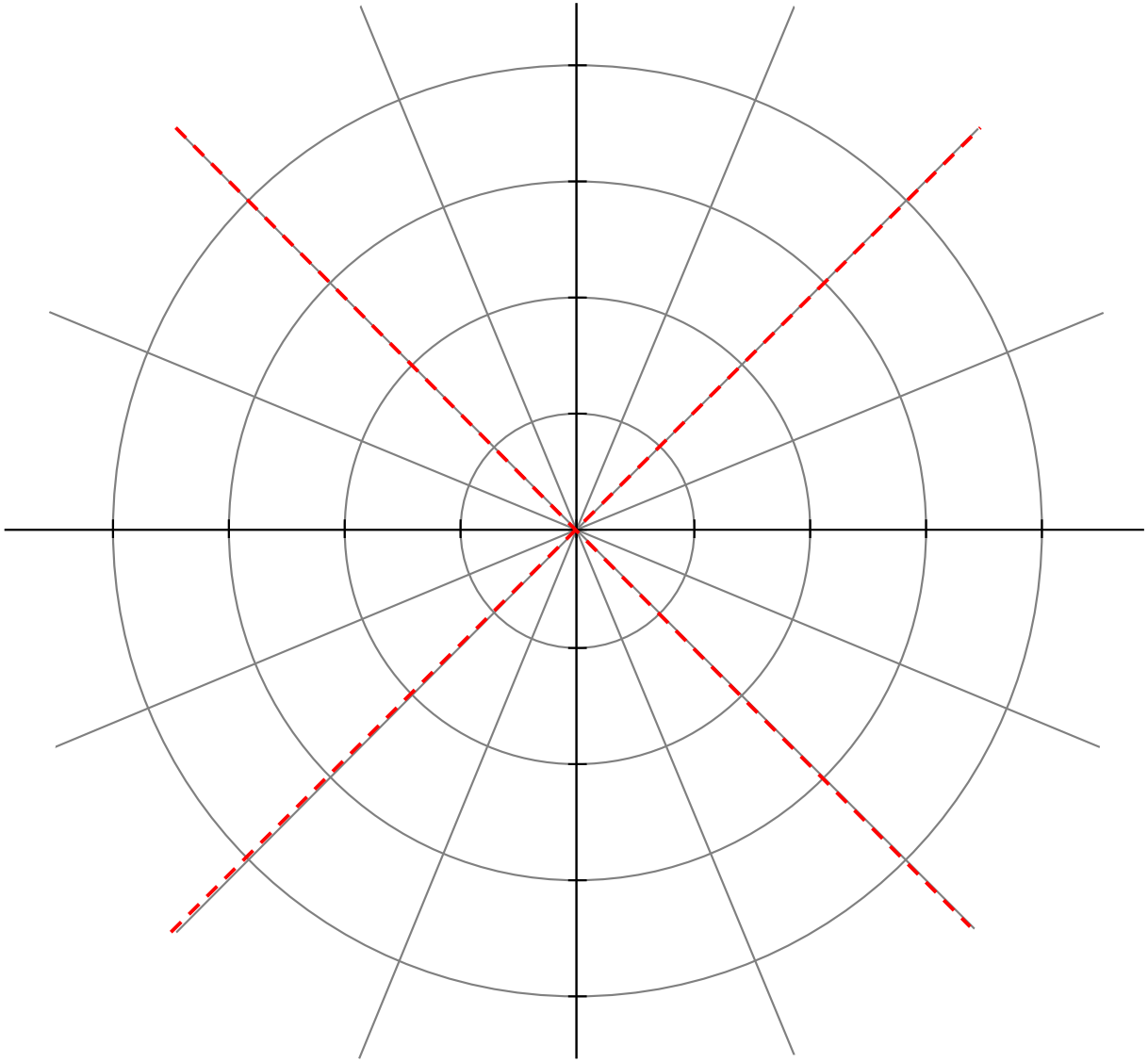
B. $\left[3, -\frac{\pi}{6}\right]$

C. $\left[3, \frac{11\pi}{6}\right]$

D. $\left[-2, \frac{-\pi}{3}\right]$

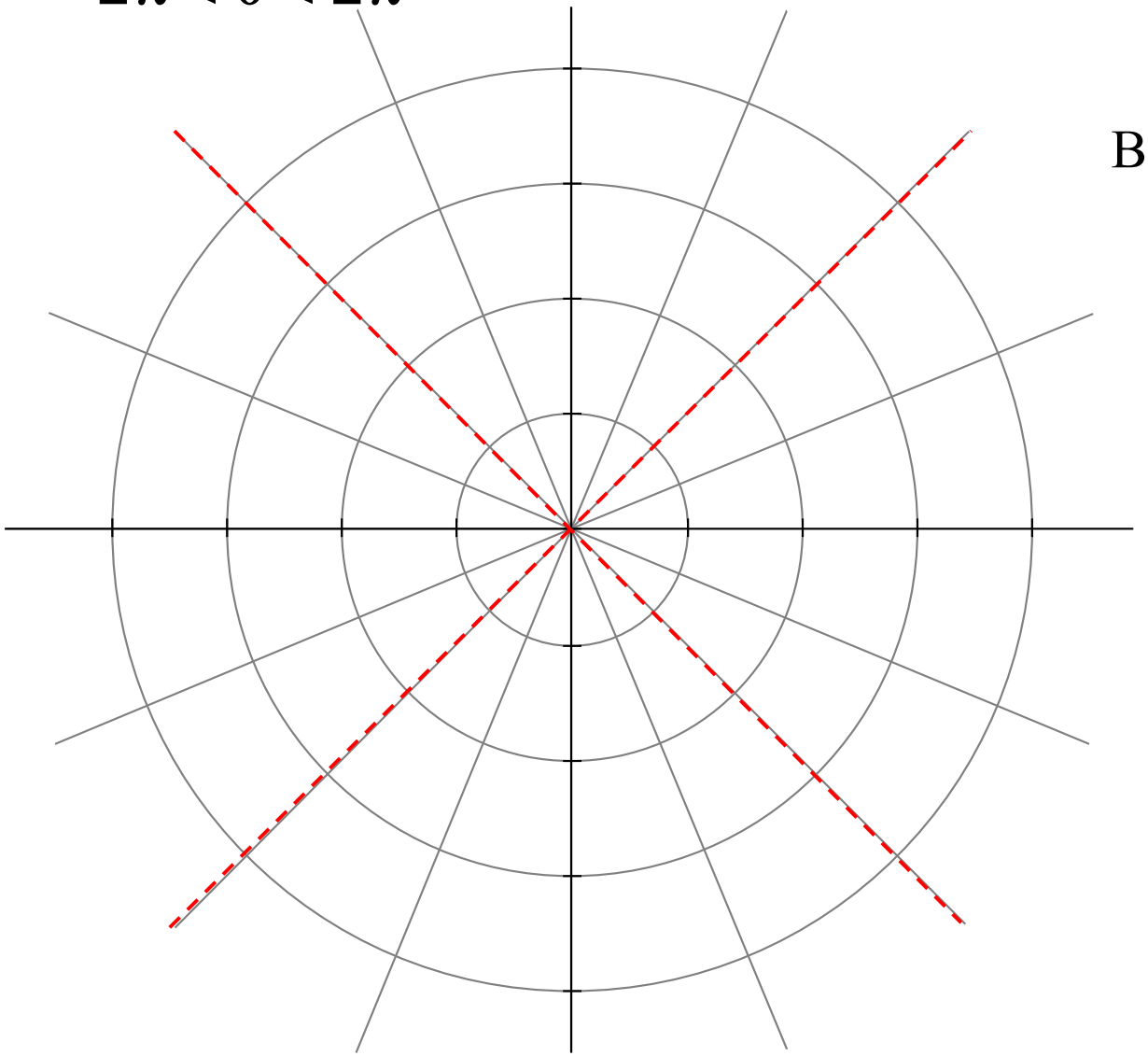
E. $\left[2, \frac{5\pi}{3}\right]$

F. $\left[-2, \frac{\pi}{4}\right]$



Plot the points and find three additional polar representations of each point using $-2\pi < \theta < 2\pi$

A $\left[3, \frac{-3\pi}{4}\right]$



B $\left[4, \frac{3\pi}{4}\right]$

Note : $\left[r,\theta\right] = \left[r,\theta \pm 2n\pi\right] = \left[-r,\theta \pm \left(2n+1\right)\pi\right]$ and $\left[r,\theta+\pi\right] = \left[-r,\theta\right]$

Changing from polar form to rectangular form:

Formulas: $x = r\cos\theta \quad y = r\sin\theta$

Example **:** Change the following to rectangular form

A. $\left[2, \frac{\pi}{3}\right]$

B. $\left[\sqrt{3}, \pi\right]$

Changing from rectangular to polar form:

Formulas: $x^2 + y^2 = r^2$ For θ, can use formulas above or $\theta = \arctan\frac{y}{x}, x \neq 0$

Example: Change the following to polar form:

A. $\left(1,-\sqrt{3}\right)$

B. $\left(2,-2\right)$

More examples:

1. Write the following in polar form.

A. $x^2 - y^2 = 4$

B. $y = 4$

C. $y = x$

2. Write in rectangular form and describe the graph.

A. $r\sin\theta = 4$

B. $\theta = \frac{1}{3}\pi$

C. $r = 3\cos\theta$

D. $r = \csc\theta$

E. $r = \frac{1}{1 - cos\theta}$

Popper 30

1. The graph of $y^2 + x^2 = 4$ is a(n)

2. The graph of $r = 2$ is a(n)

3. The polar graph of $r = 2\,sec(\theta)$ is a

4. The polar graph of $r = sec(\theta)tan(\theta)$ is