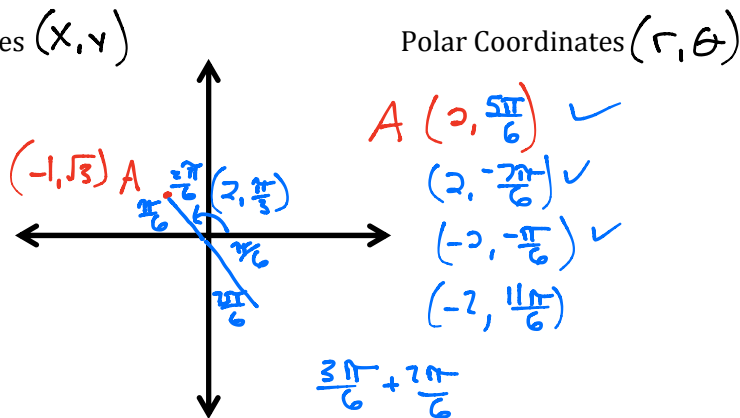


13.2 Polar Coordinates

Write your questions here!

Rectangular Coordinates (x, y)

$A(1, \sqrt{3})$



Polar Coordinates (r, θ)

$A(2, \frac{\pi}{3})$ ✓

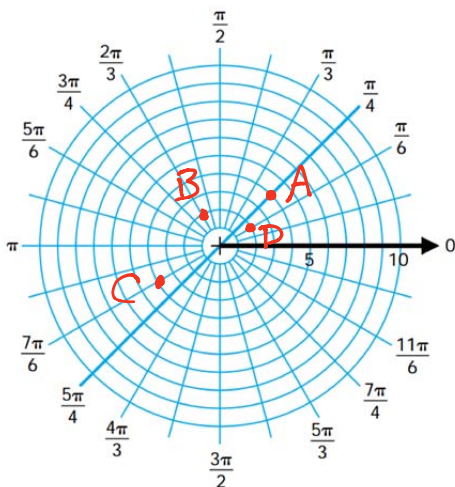
$(2, -\frac{7\pi}{6})$ ✓

$(-2, -\frac{\pi}{6})$ ✓

$(-2, \frac{11\pi}{6})$

$\frac{3\pi}{6} + \frac{2\pi}{6}$

Polar Coordinates: (r, θ) with radians:



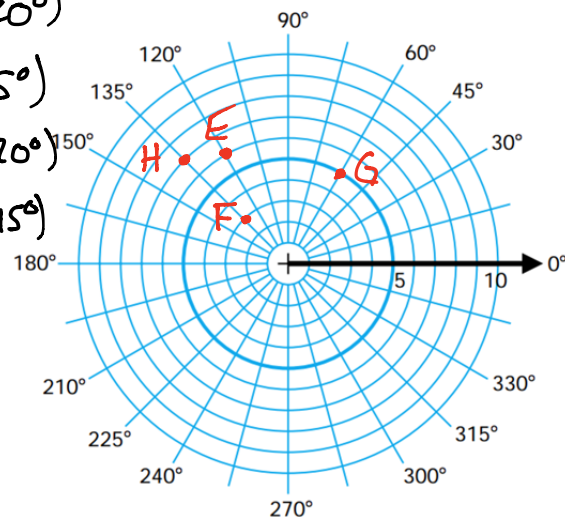
Polar Coordinates: (r, θ) with degrees:

$E(6, 120^\circ)$

$F(-3, 315^\circ)$

$G(5, -120^\circ)$

$H(-7, -45^\circ)$



$A(4, \frac{\pi}{4})$

$B(2, \frac{2\pi}{3})$

$C(-3, \frac{\pi}{6})$

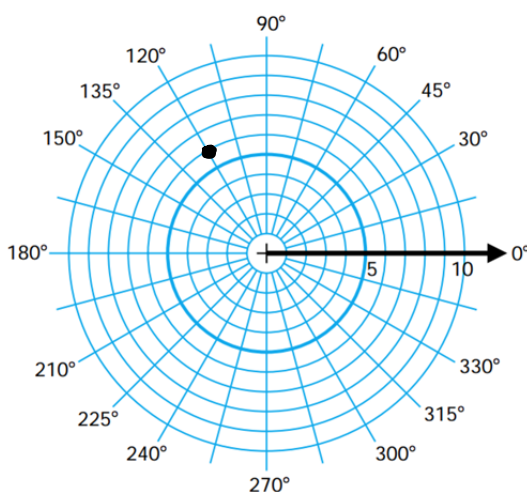
$D(-1, -\frac{5\pi}{6})$

Rename the following points 2 different ways

$(6, 120^\circ)$

$(6, -240^\circ)$

$(-6, 300^\circ)$

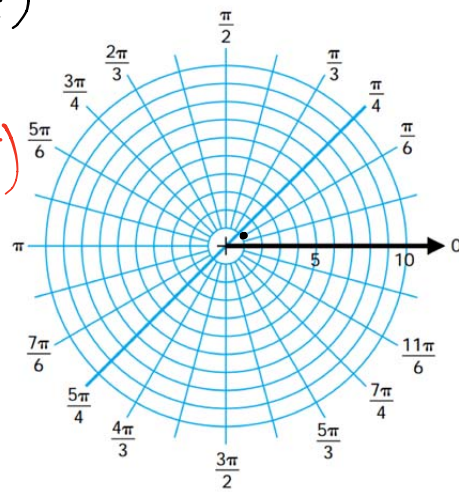


$(-1, -\frac{5\pi}{6})$

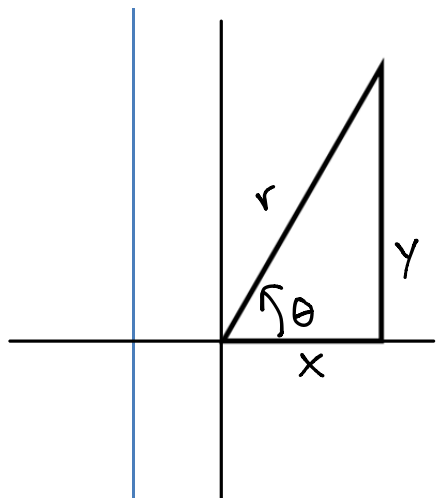
$(1, \frac{\pi}{6})$

$(1, -\frac{11\pi}{6})$

$(-1, \frac{7\pi}{6})$



Converting



From Polar

To find x : $\cos \theta = \frac{x}{r} \Rightarrow x = r \cos \theta$

To Rectangular

To find y : $\sin \theta = \frac{y}{r} \Rightarrow y = r \sin \theta$

From Rectangular

To find r : $x^2 + y^2 = r^2$

To Polar

To find θ : $\tan \theta = \frac{y}{x}$ (this will give reference like angle only)

Convert to Polar (Radian answer)

$(-4, 4)$ $(-8, -3)$

Convert to Rectangular (3 decimal places)

$(5, 120^\circ)$ $(6, -45^\circ)$

$\tan \theta = \frac{y}{x}$
 $\tan \theta = \frac{4}{-4}$
 $\tan \theta = -1$
 $\theta = \frac{\pi}{4}$

$x^2 + y^2 = r^2$
 $(-4)^2 + (4)^2 = r^2$
 $16 + 16 = r^2$
 $32 = r^2$
 $\pm \sqrt{32} = r$

$(5.657, \frac{3\pi}{4})$

$x = r \cos \theta$
 $x = 5 \cos 120^\circ$
 $x = 5(-\frac{1}{2})$
 $x = -\frac{5}{2}$

$y = r \sin \theta$
 $y = 5 \sin 120^\circ$
 $y = 5(\frac{\sqrt{3}}{2})$
 $y = \frac{5\sqrt{3}}{2}$

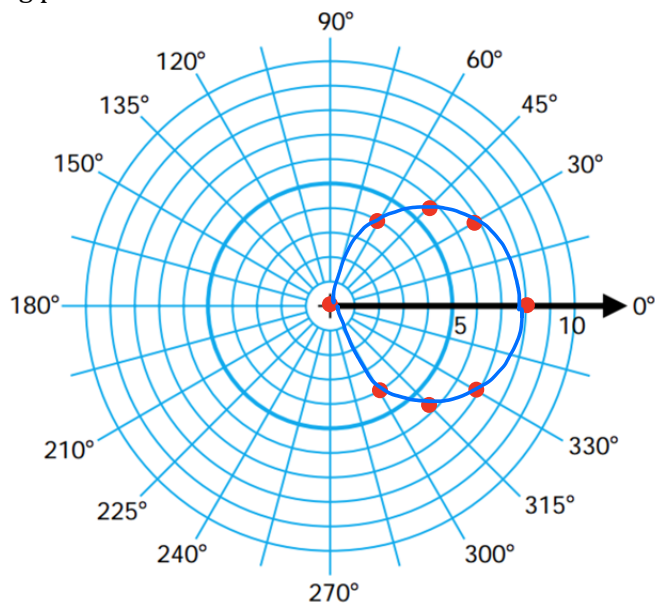
$(-\frac{5}{2}, \frac{5\sqrt{3}}{2})$

Graph the equation by finding and plotting points.

$r = 8 \cos \theta$

θ	r
30°	6.9
45°	5.7
60°	4
90°	0
120°	-4
135°	-5.7
150°	-6.9
180°	-8

0° 8



SUMMARY:

Now, summarize your notes here!