Trig 9.1

angle CCW
distance Pyth. thm

Graph polar coordinates
Graph polar equations
Determine distance between 2 polar coordinates

ordered pair (r, θ)

Cartesian coordinates (x, y)

polar coordinate system (r, θ)

polar axis

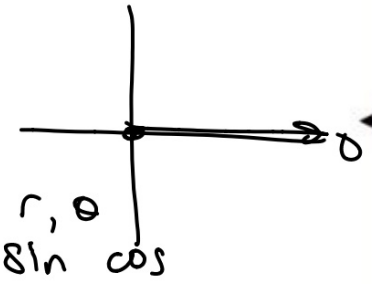
pole (origin)

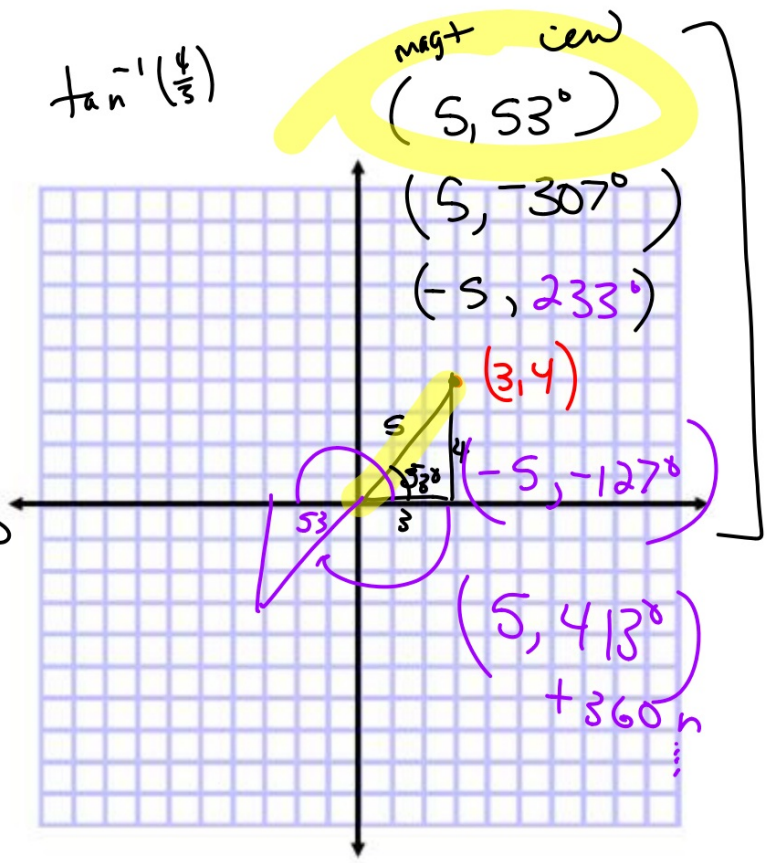
polar equation r, θ sin cos

polar graph

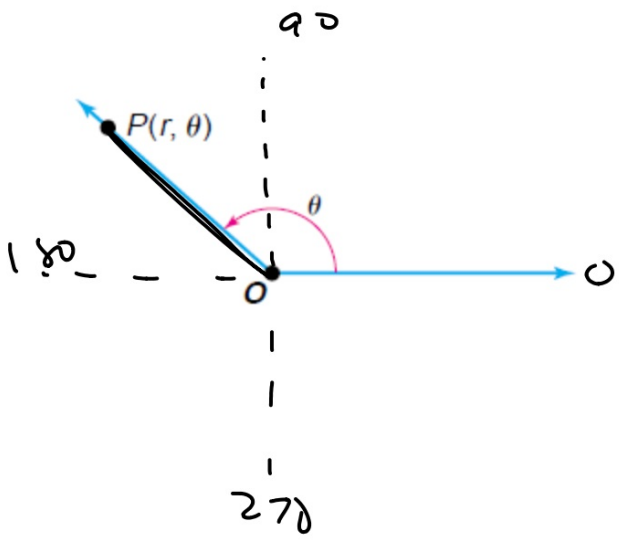
L.O.C. distance P.T.

$a^2 = b^2 + c^2 - 2bc \cdot \cos A$



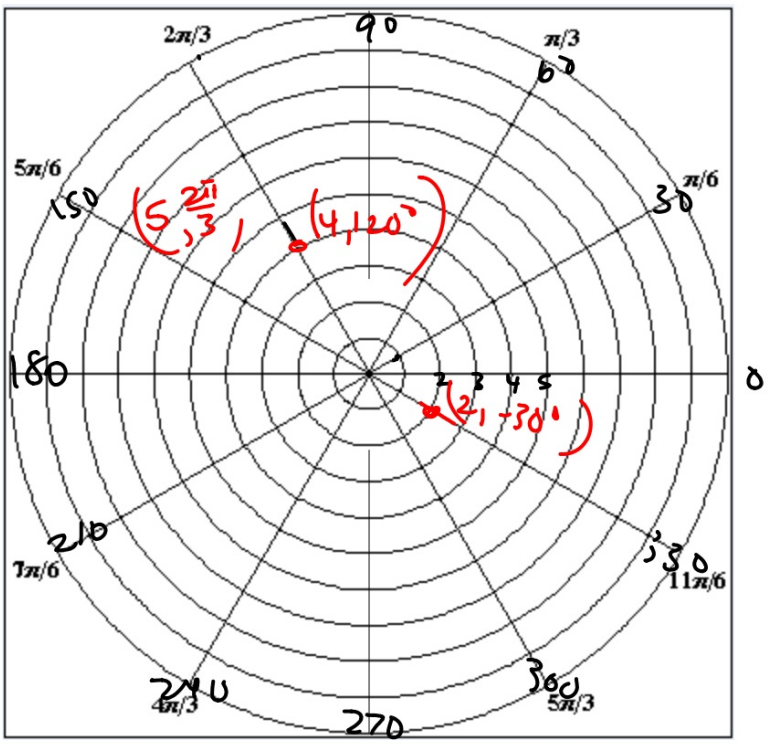


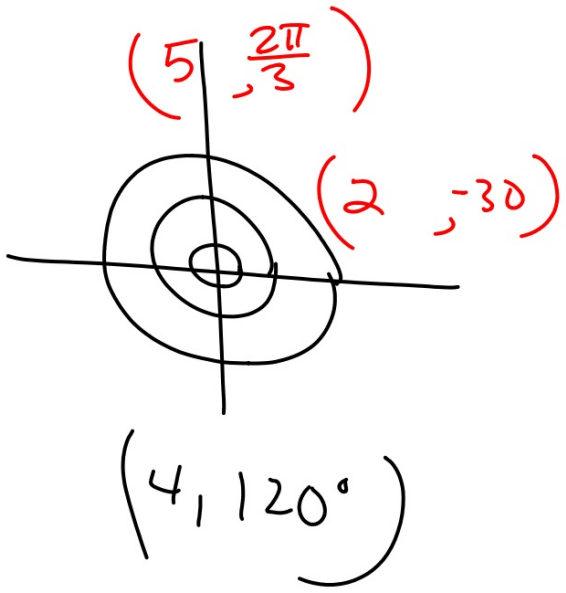
Floor graphs
1. rotate ccw
2. step (forward)



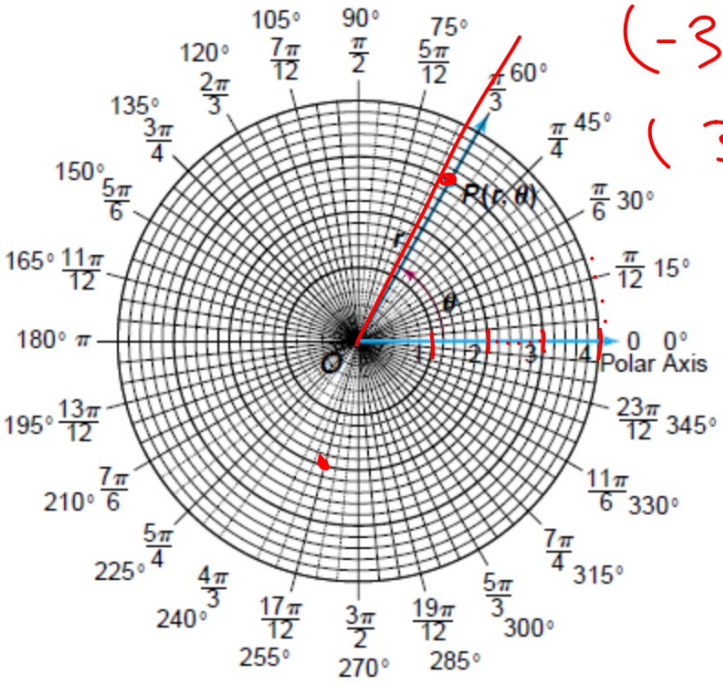
But what if the angle is negative?

Floor graphs


90
π/3
60
2π/3
π/6
30
5π/6
150
180
0
210
7π/6
330
11π/6
240
4π/3
300
5π/3
270
(5, 2π/3)
(4, 120°)
(2, -30°)


(5, 2π/3)
(2, -30)

(4, 120°)



$(-3, 60^\circ)$

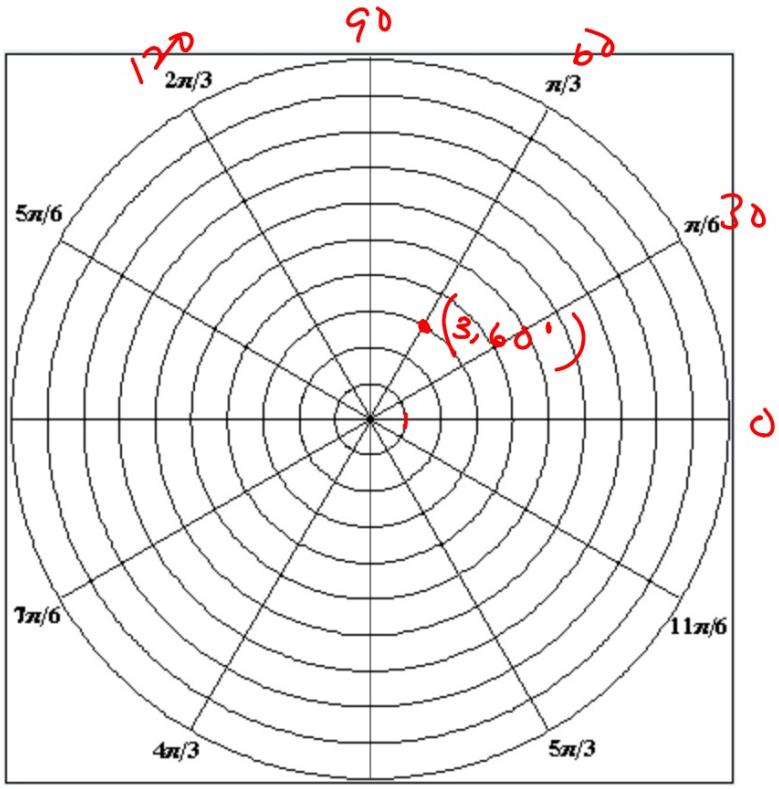
$(3, \frac{\pi}{3})$

What if the distance is negative?

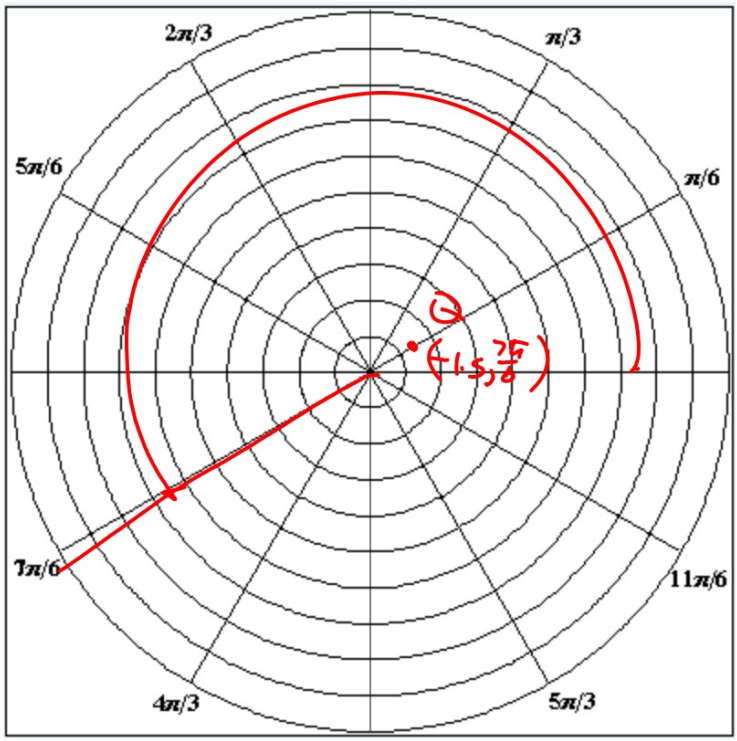
1 **Graph each point.**

a. $P(3, 60°)$

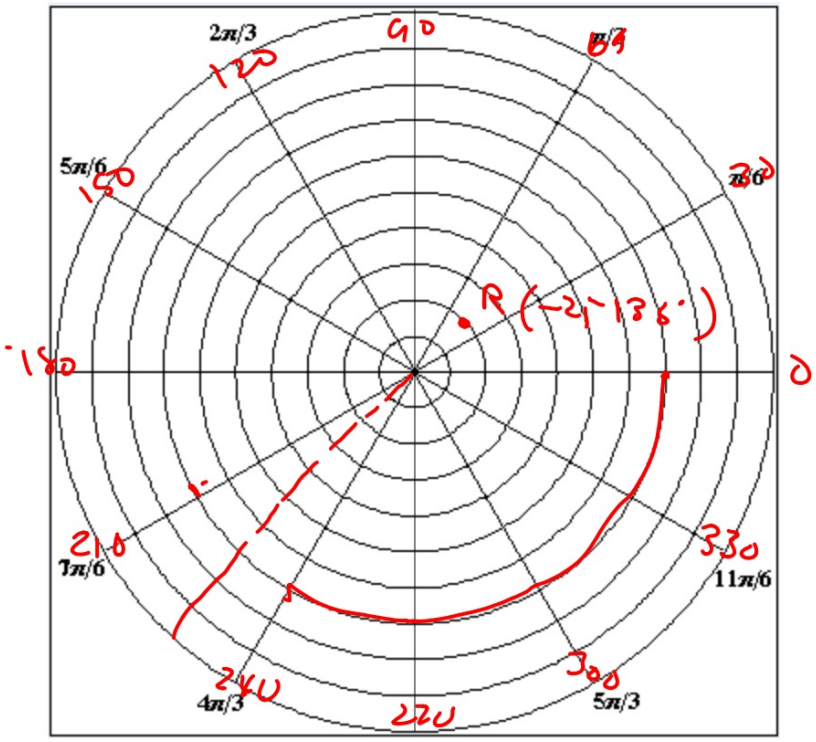
$(4, 120°)$



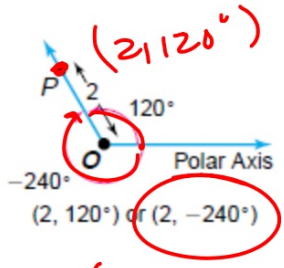
b. $Q\left(-1.5, \frac{7\pi}{6}\right)$



2 Graph $R(-2, -135°)$.

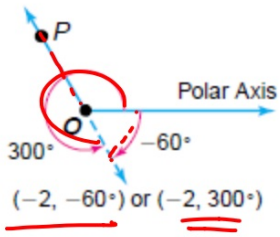


Name the point 4 ways:
Floor graphs



(2, 120°)

(2, −240°)



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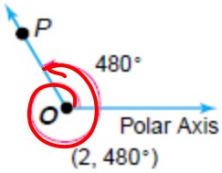
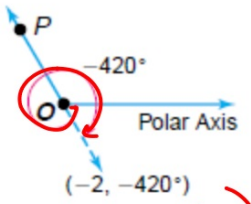


+360n



(n is an int.)

$\mathbb{Z}$

$n \in \mathbb{Z}$

3 Name four different pairs of polar coordinates that represent point S on the graph with the restriction that $-360° \leq \theta \leq 360°$.

* (3 150°)

(3 -210°)

(-3 , 330°)

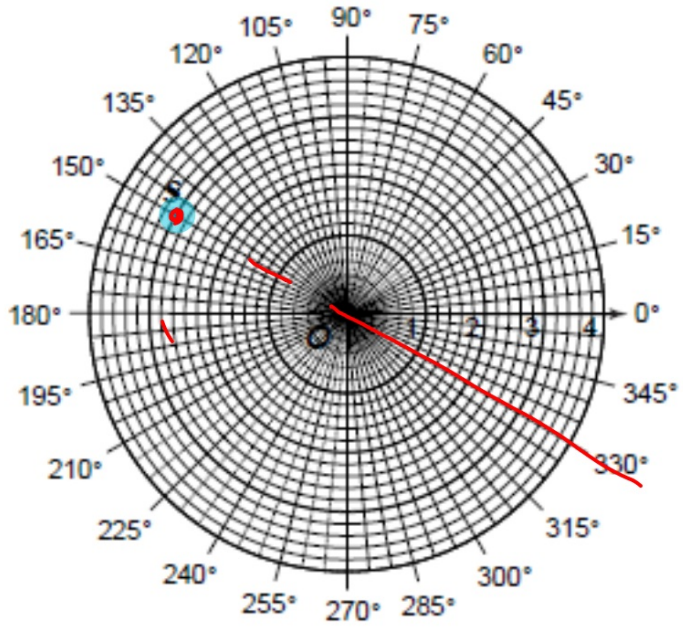
(-3 , -30°)

s,

0

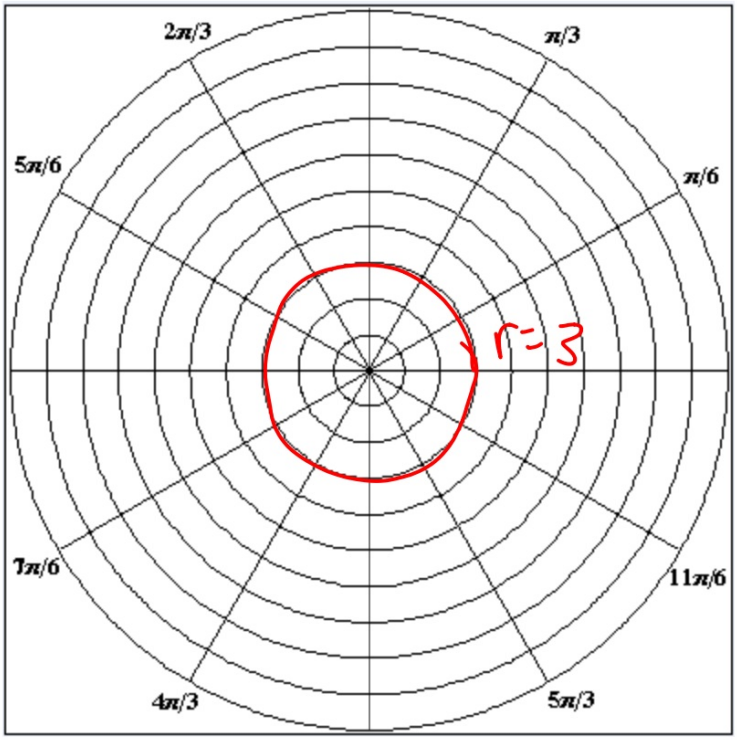
.

)



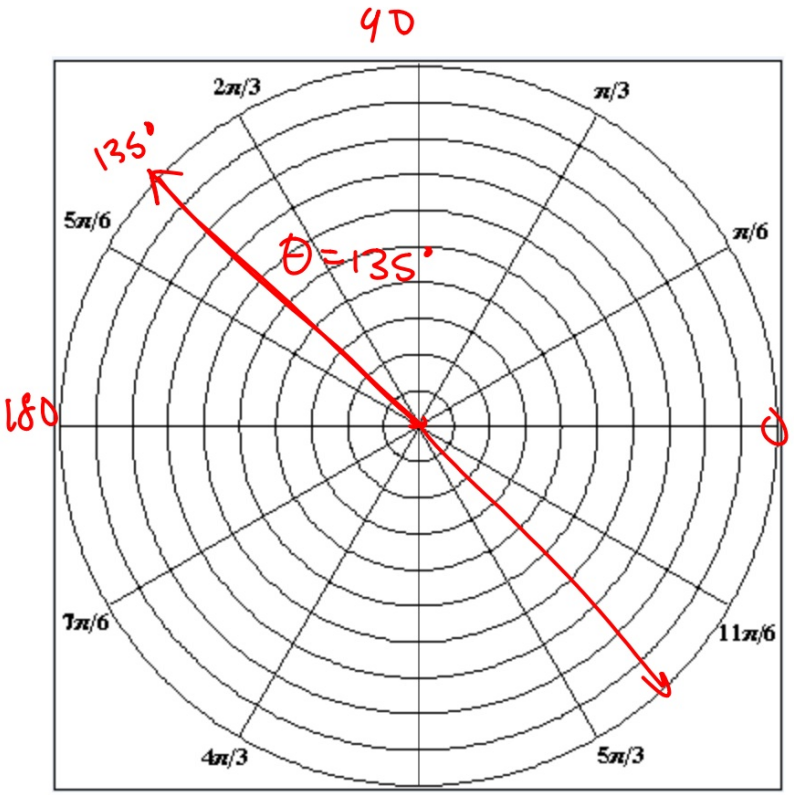
4 Graph each polar equation.

a. $r = 3$



b. $\theta = \frac{3\pi}{4}$

$\theta = 135°$



9.1 17-41 odd

Distance Formula in Polar Plane	If $P_1(r_1, \theta_1)$ and $P_2(r_2, \theta_2)$ are two points in the polar plane, then $P_1P_2 = \sqrt{r_1^2 + r_2^2 - 2r_1r_2 \cos(\theta_2 - \theta_1)}$.

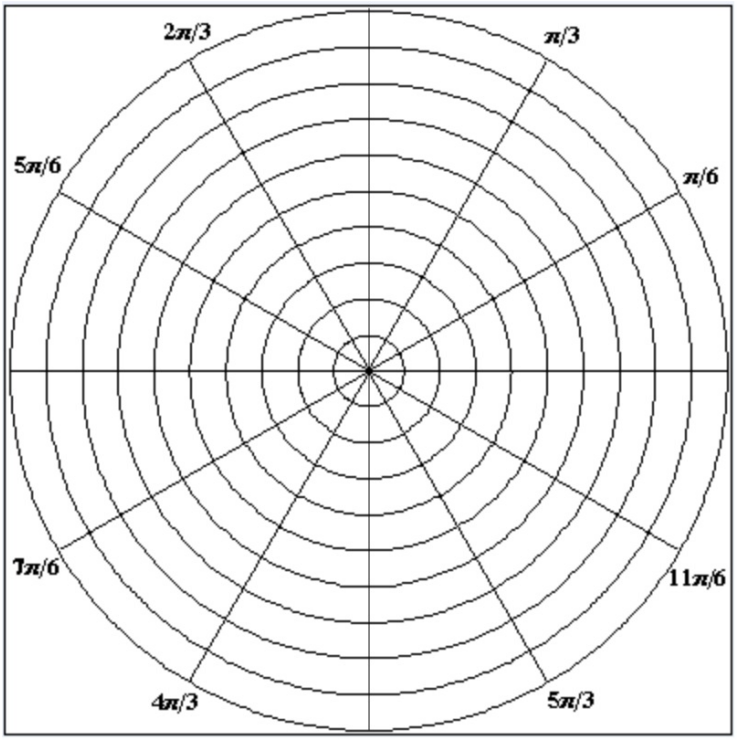
$a^2 = b^2 + c^2 - 2bc \cdot \cos A$

Not sure this formula is worthy: comes from law of cosines

Find the distance between the points with the given polar coordinates.

Why $x_2 - x_1$?

42. $P_1(4, 170°)$ and $P_2(6, 105°)$


2π/3
π/3
5π/6
π/6
7π/6
11π/6
4π/3
5π/3