Trig 9.1

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

ordered pair
Cartesian coordinates
polar coordinate system
polar axis
pole (origin)
polar equation
polar graph
distance

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

$4^2+3^2=h^2$ $\tan^{-1}\left(\frac{3}{4}\right)$

$5=h$ 90

$(5, 37°)$

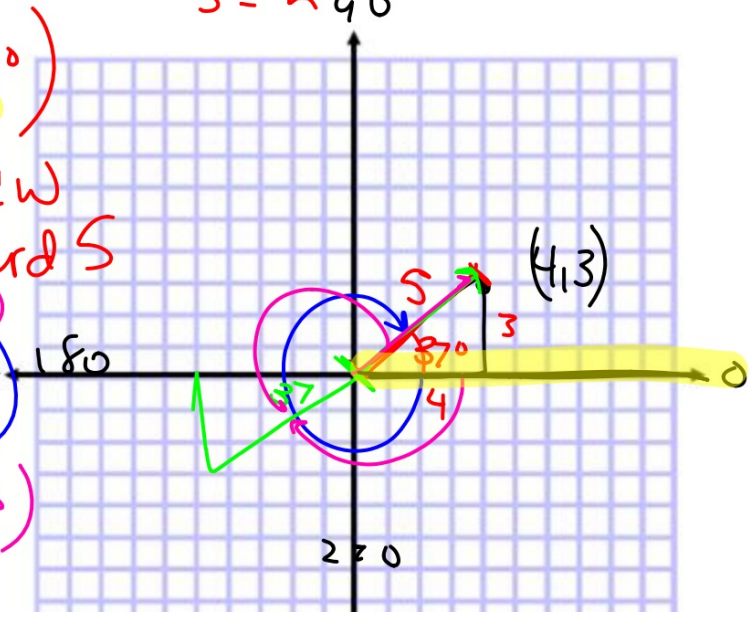
37° CCW

forward 5

$(-5, -143°)$

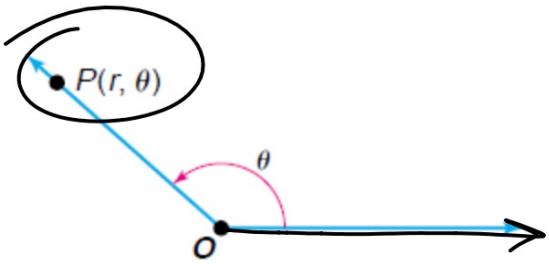
$(5, -323°)$

$(-5, 217°)$



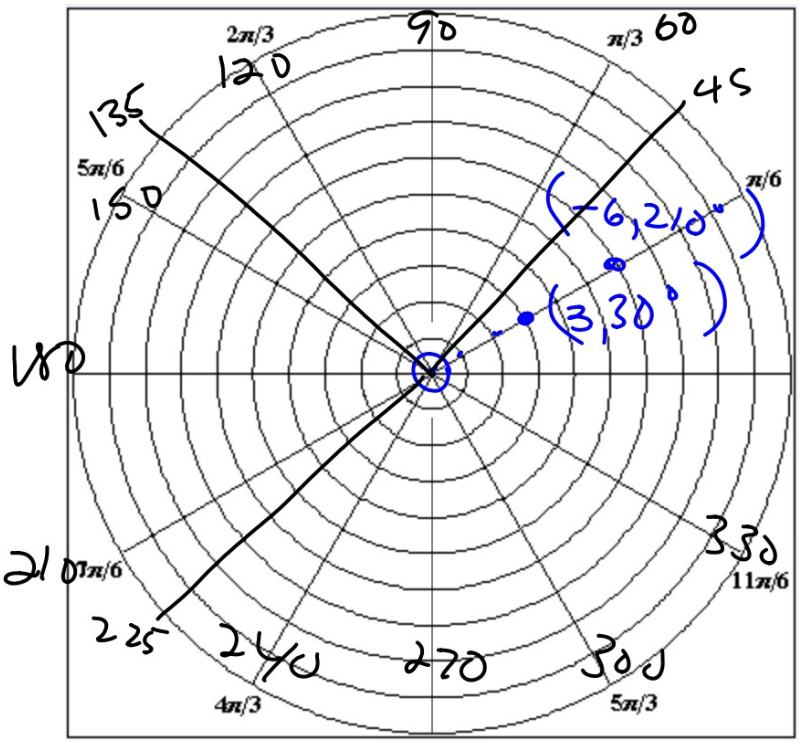
Floor graphs
1. rotate
2. step (forward)

CCW (+)
CW -



But what if the angle is negative?

Floor graphs

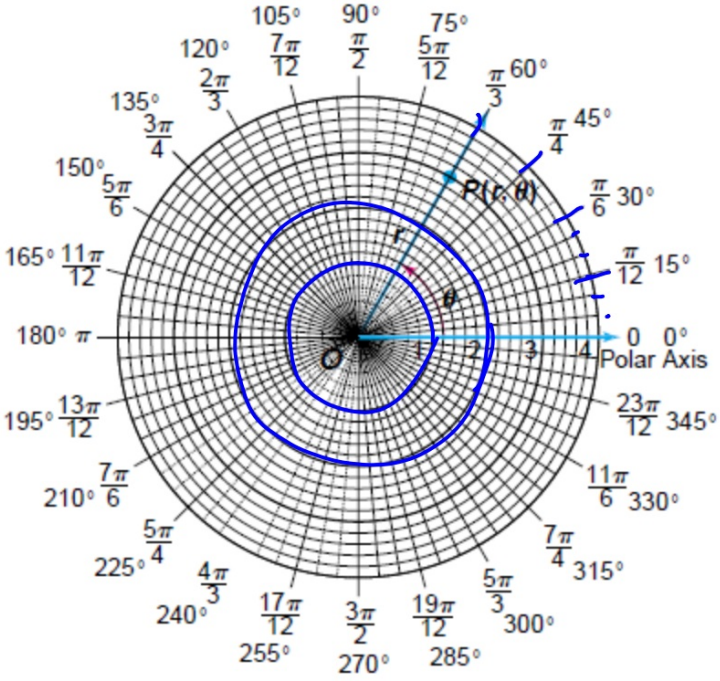


$(-6, 210°)$

$(3, 30°)$

$(3, 30°)$

$(-6, 210°)$

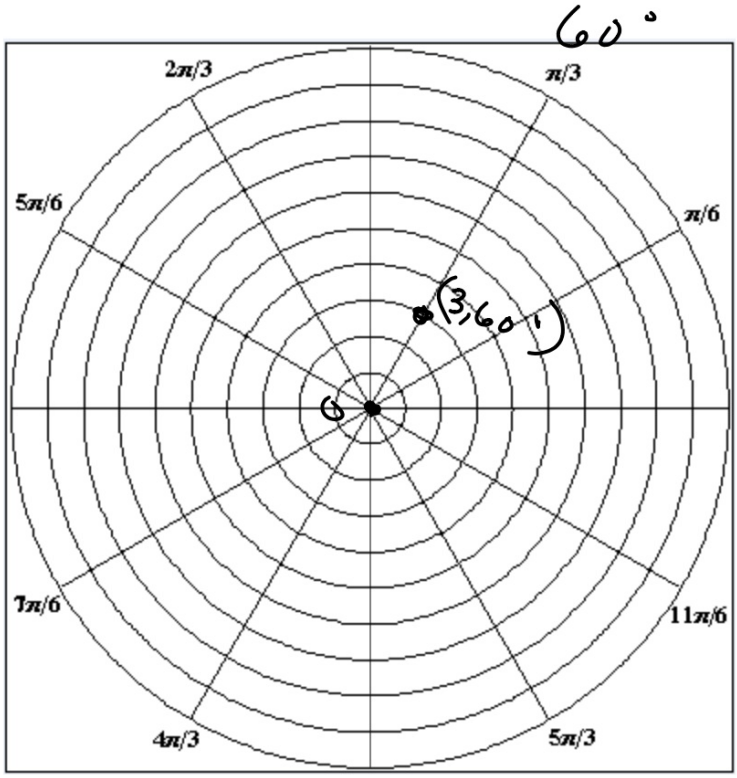

105° 7π/12
90° π/2
75° 5π/12
120° 2π/3
60° π/3
135° 3π/4
45° π/4
150° 5π/6
P(r, θ)
30° π/6
165° 11π/12
15° π/12
r
θ
180° π
0 0°
O
1
2
3
4
Polar Axis
195° 13π/12
23π/12 345°
210° 7π/6
11π/6 330°
225° 5π/4
7π/4 315°
4π/3
5π/3
240°
300°
17π/12
19π/12
3π/2
255°
285°
270°

What if the distance is negative?

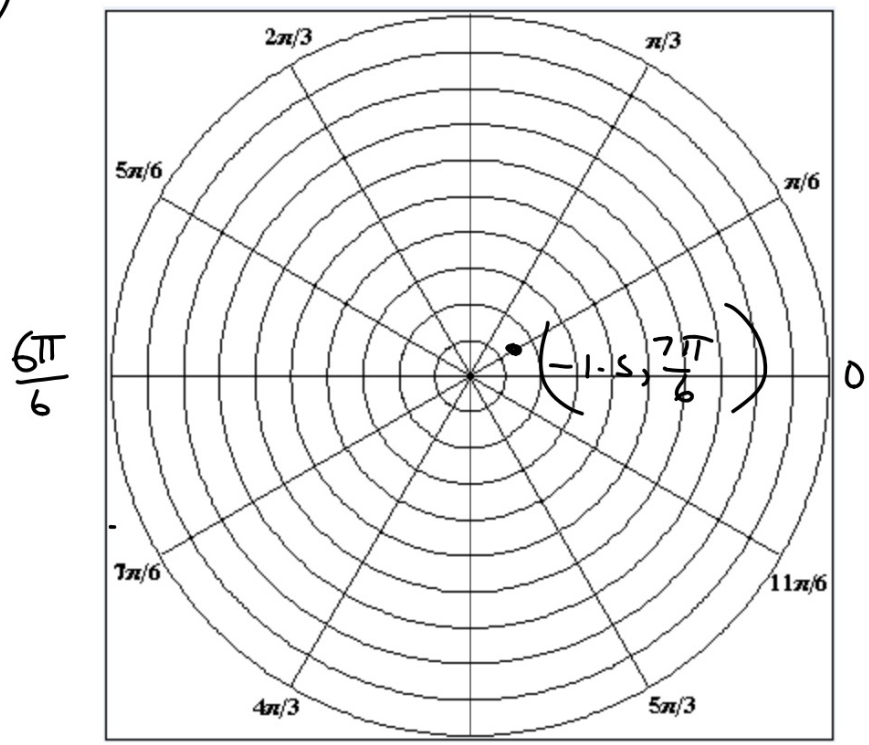
back up

1 **Graph each point.**

a. $P(3, 60°)$

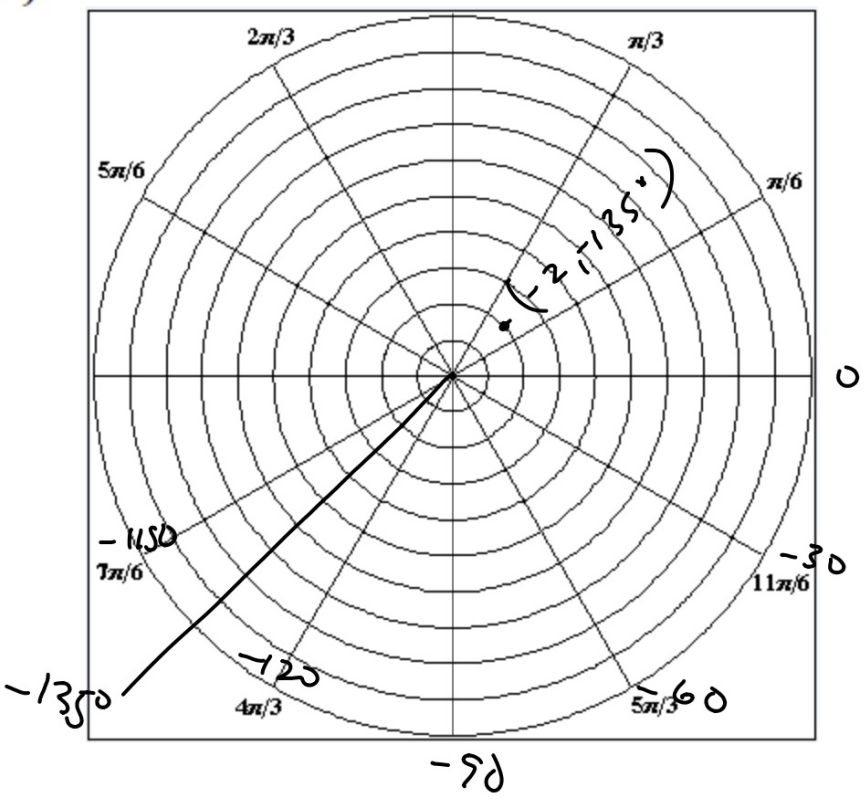


b. $Q\left(-1.5, \frac{7\pi}{6}\right)$

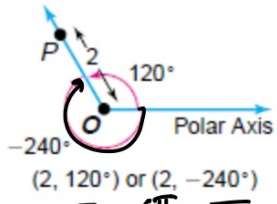


CW

2 Graph $R(-2, -135°)$.

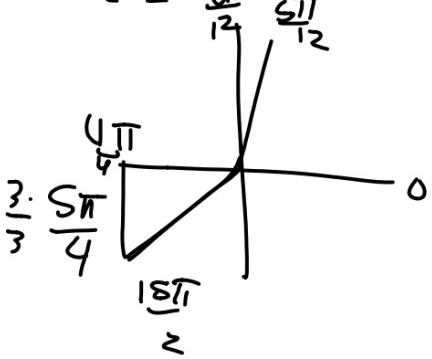


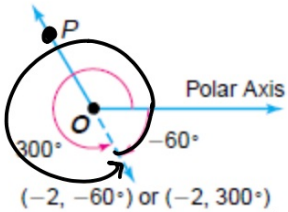
Name the point 4 ways:
Floor graphs



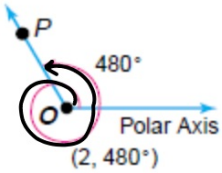
(2, 120°) or (2, −240°)

= = $\frac{6\pi}{12}$ $\frac{5\pi}{12}$

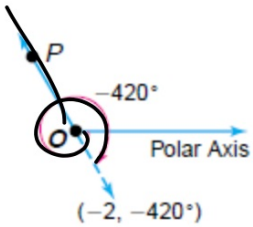




(−2, −60°) or (−2, 300°)



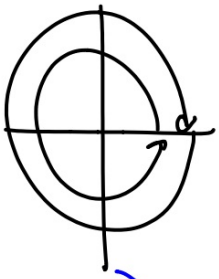
(2, 480°)



(−2, −420°)

-360
-60
$(-2, -420^\circ)$

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



$(3, 150°)$

$(3, -210°)$

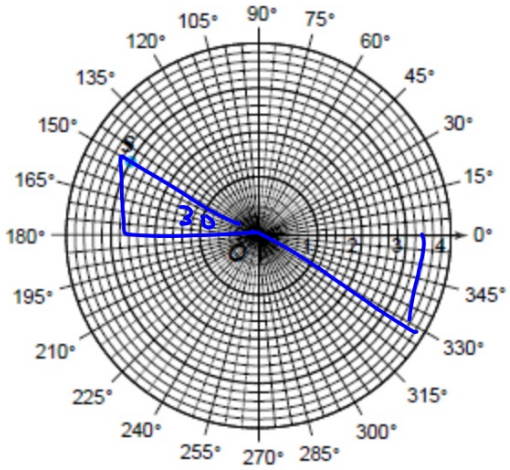
$(-3, -30°)$

$(-3, 330°)$

s,

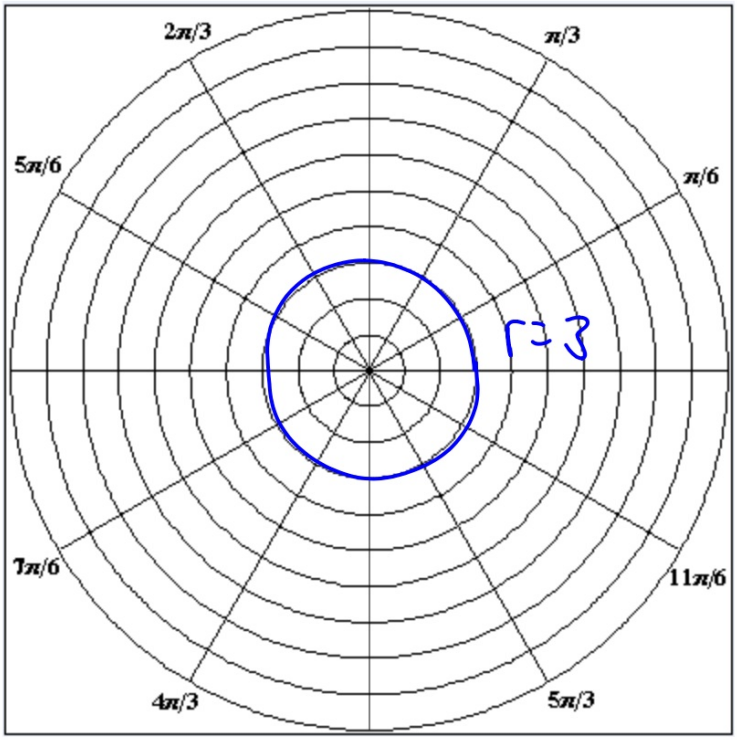
0

)



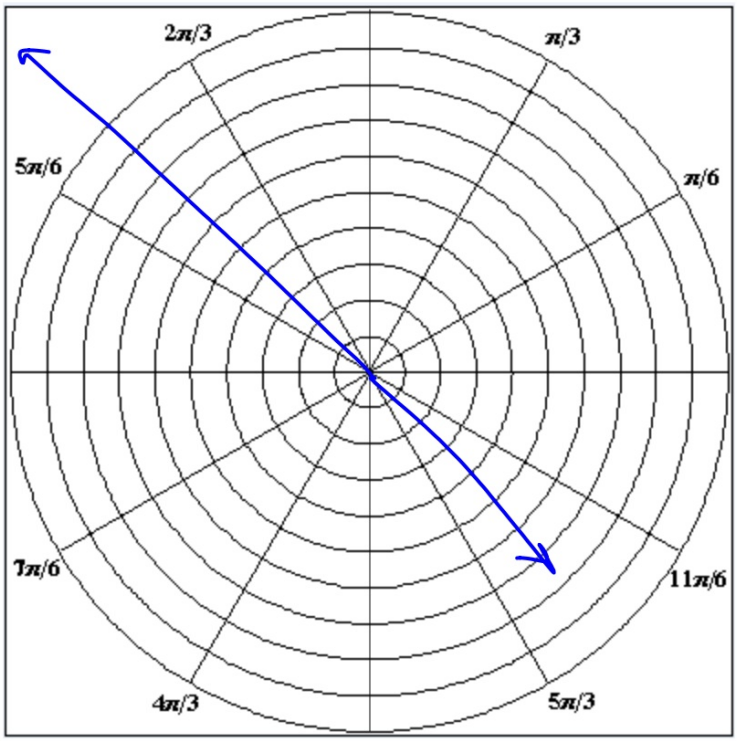
4 Graph each polar equation.

a. $r = 3$



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

$\theta = 135^\circ$



L.O.C. $a^2 = b^2 + c^2 - 2bc \cdot \cos A$ p558 17-45

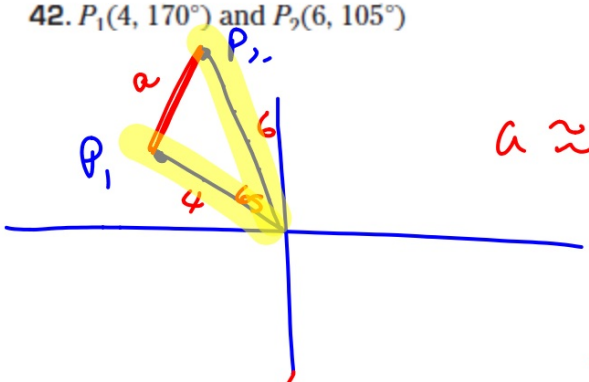
Distance Formula in Polar Plane	If $P_1(r_1, \theta_1)$ and $P_2(r_2, \theta_2)$ are two points in the polar plane, then $P_1P_2 = \sqrt{r_1^2 + r_2^2 - 2r_1r_2\cos(\theta_2 - \theta_1)}$.

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 $P_2(6, 105°)$

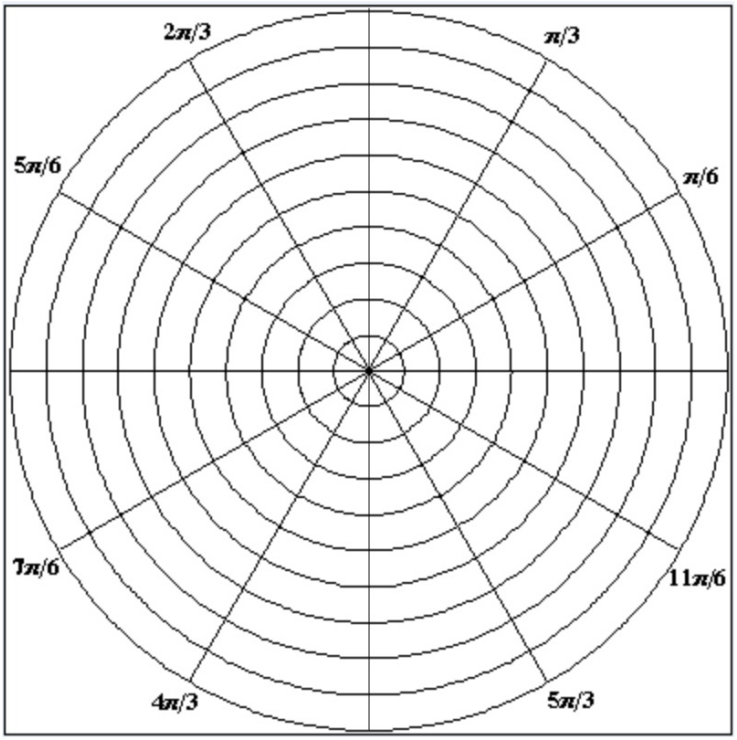


$a \approx 5.6$

$a^2 = 4^2 + 6^2 - (2 \cdot 4 \cdot 6 \cos 65)$

$a^2 = 16 + 36 - 20.2857$

$a^2 = 31.7143$


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