

Trig 9.1

Graph polar coordinates

Graph polar equations

Determine distance between 2 polar coordinates

ordered pair

$(3, 4)$ $(5, 413^\circ)$
 $(5, 773^\circ)$

Cartesian coordinates

polar coordinate system

polar axis

(r, θ) $(5, 53^\circ + 360^\circ)$

pole (origin)

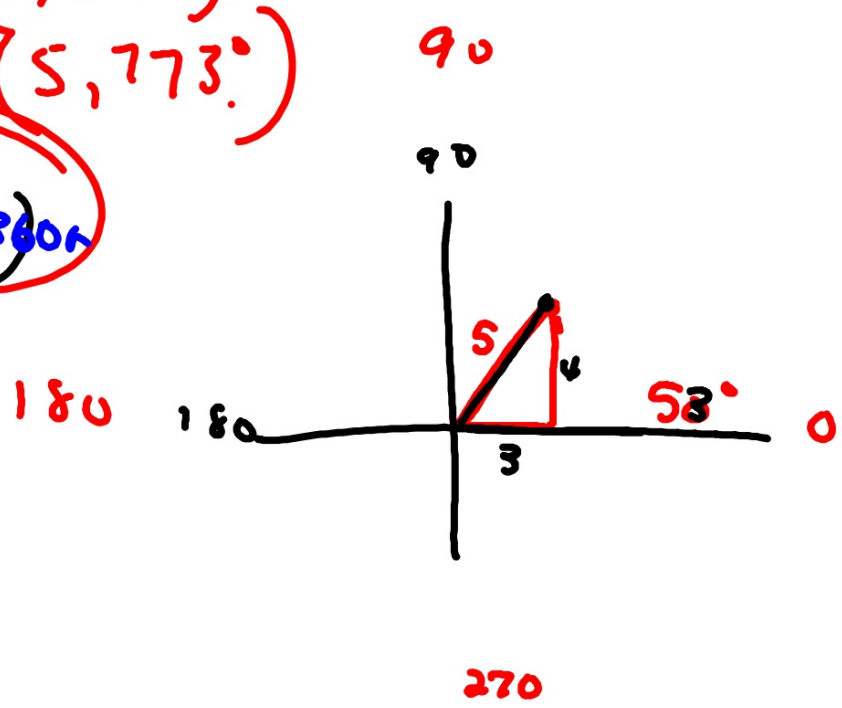
polar equation

$r =$

polar graph

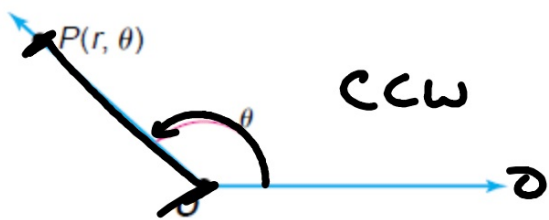
distance

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



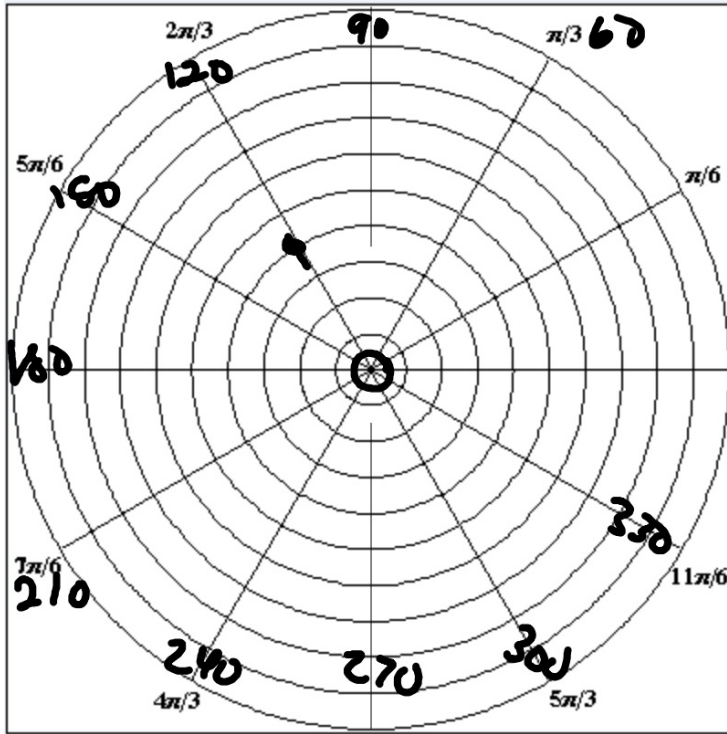
Floor graphs

1. rotate
2. step (forward)



But what if the angle is negative?

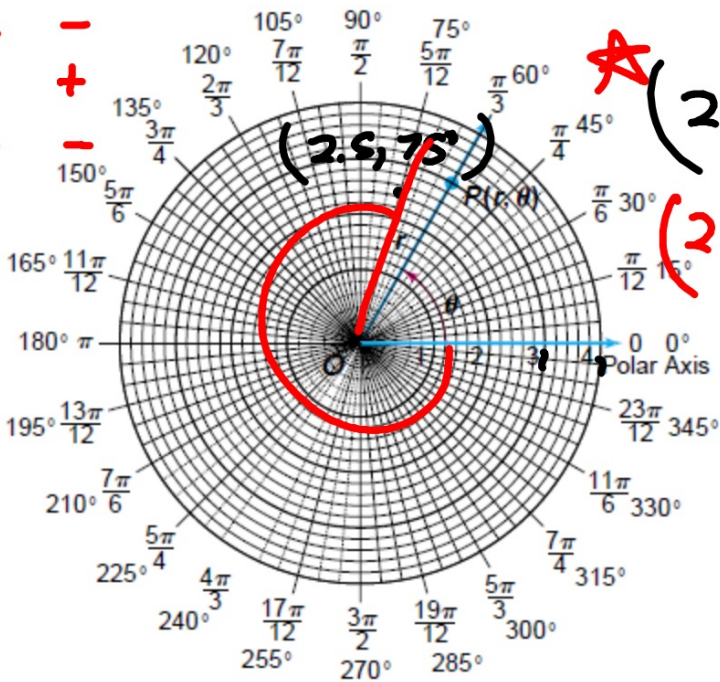
Floor graphs



$(4, 120^\circ)$

0 (360)

+ +
+ -
- +
- -

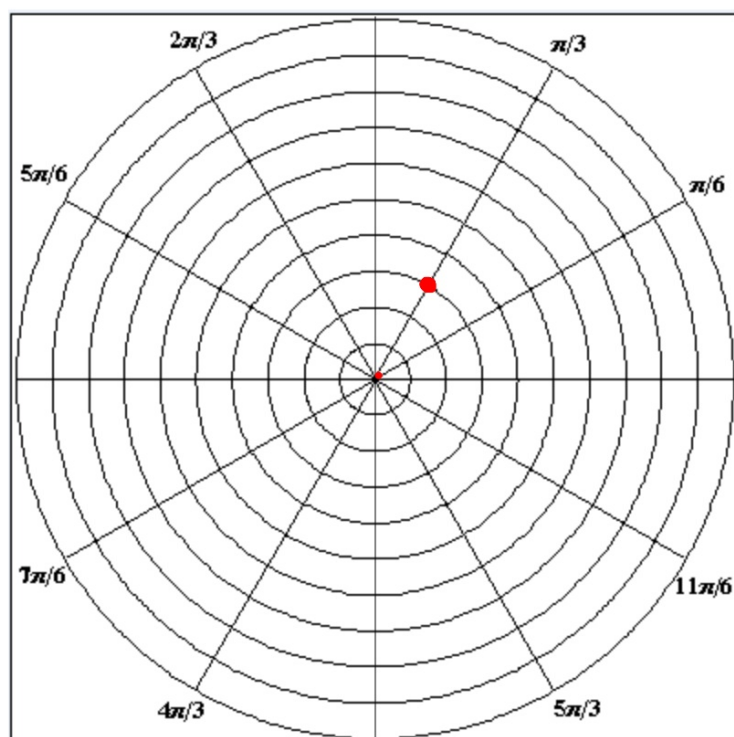


★ $(2.5, 75^\circ)$

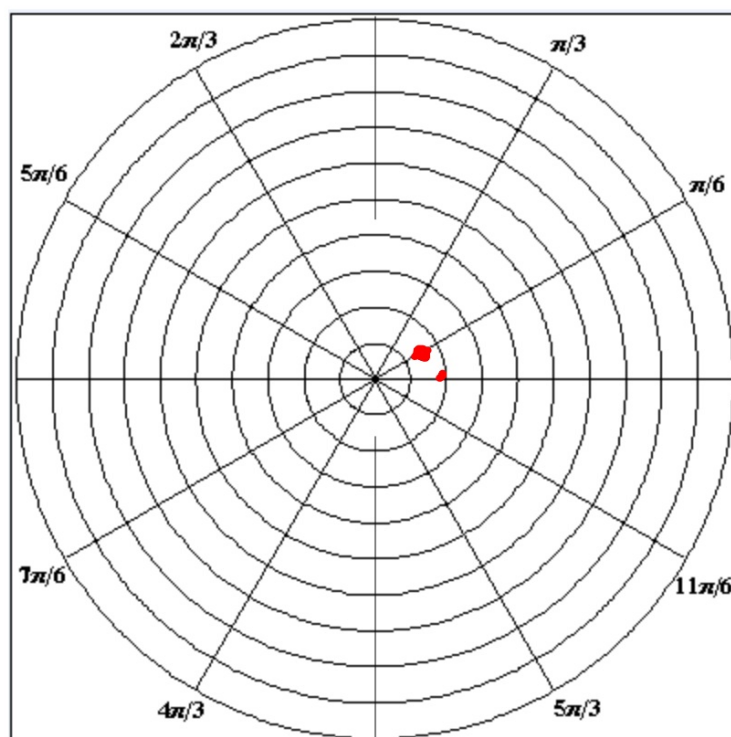
$(2.5, -285^\circ)$

What if the distance is negative?

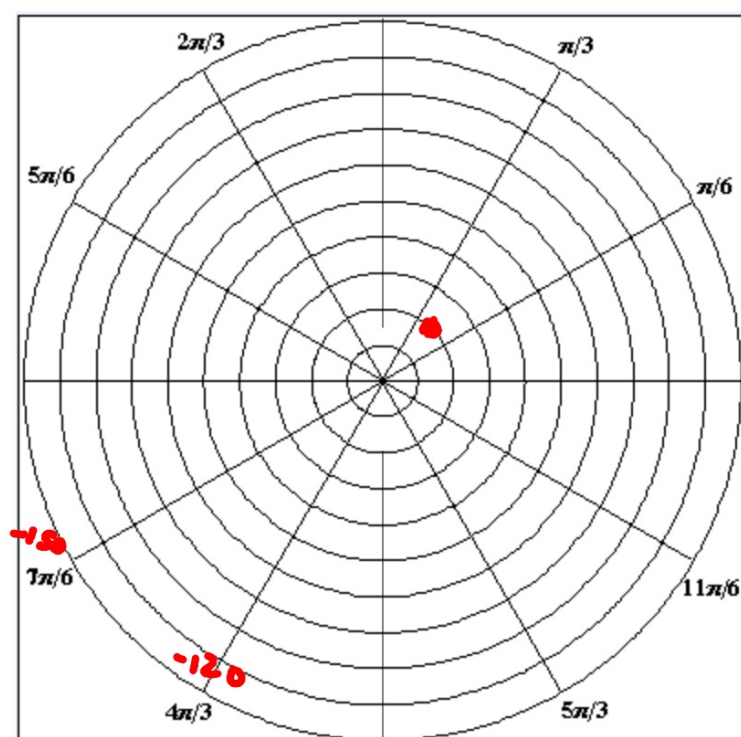
- 1** Graph each point.
a. $P(3, 60^\circ)$



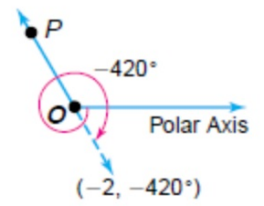
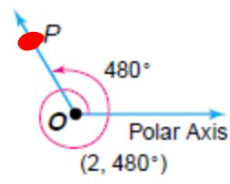
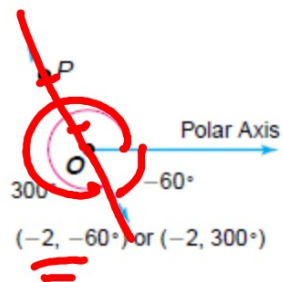
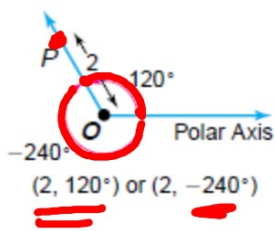
b. $Q\left(-1.5, \frac{7\pi}{6}\right)$



2 Graph $R(-2, -135^\circ)$.



Name the point 4 ways:
Floor graphs



$+360^\circ n$

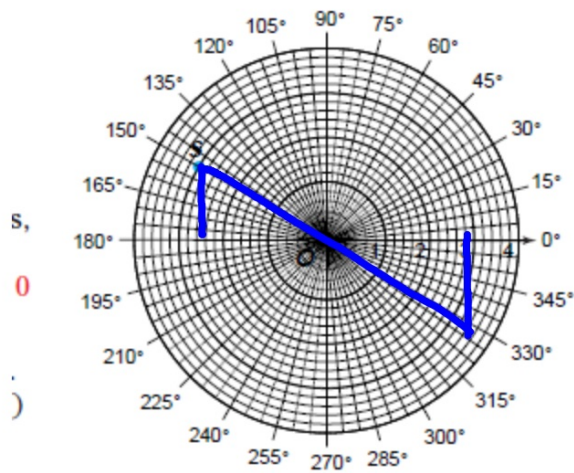
- 3 Name four different pairs of polar coordinates that represent point S on the graph with the restriction that $-360^\circ \leq \theta \leq 360^\circ$.

$$(3, 150^\circ)$$

$$(3, -210^\circ)$$

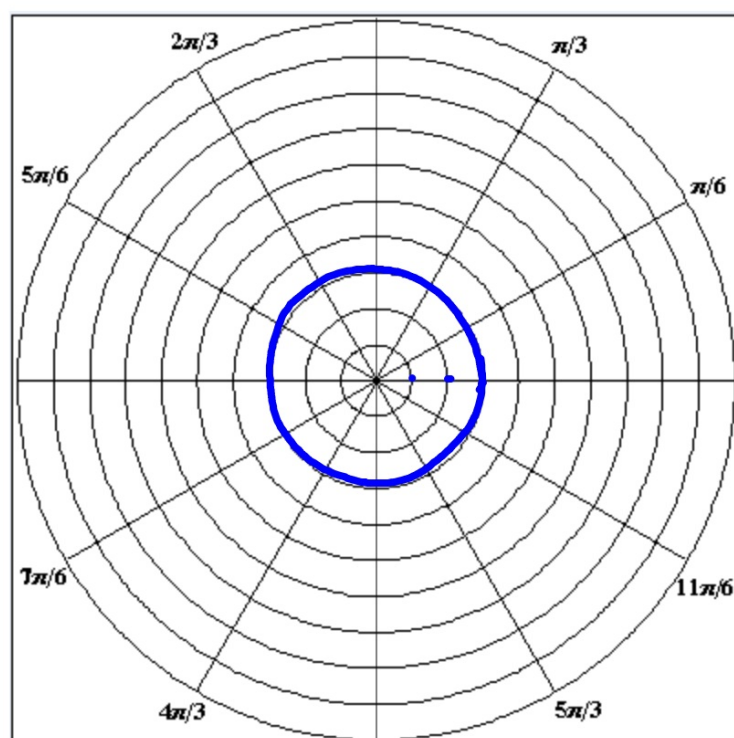
$$(-3, 330^\circ)$$

$$(-3, -30^\circ)$$

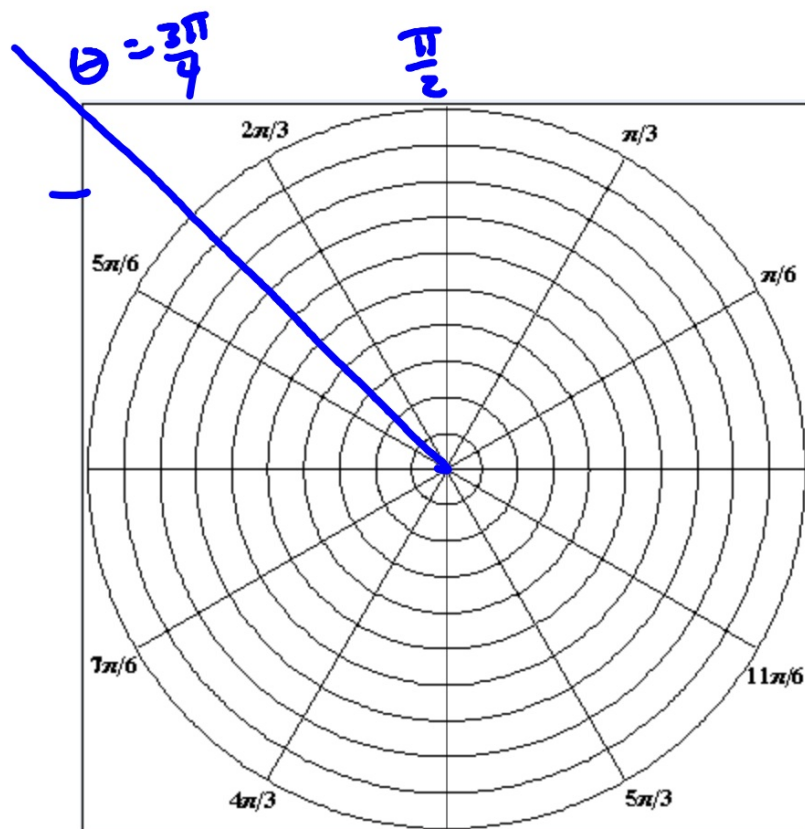


4 Graph each polar equation.

a. $r = 3$



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



**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. $P_1(4, 170^\circ)$ and $P_2(6, 105^\circ)$

