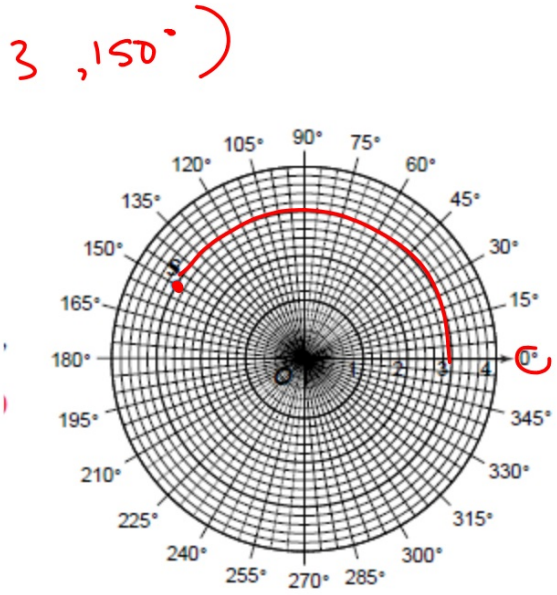
Trig 9.1

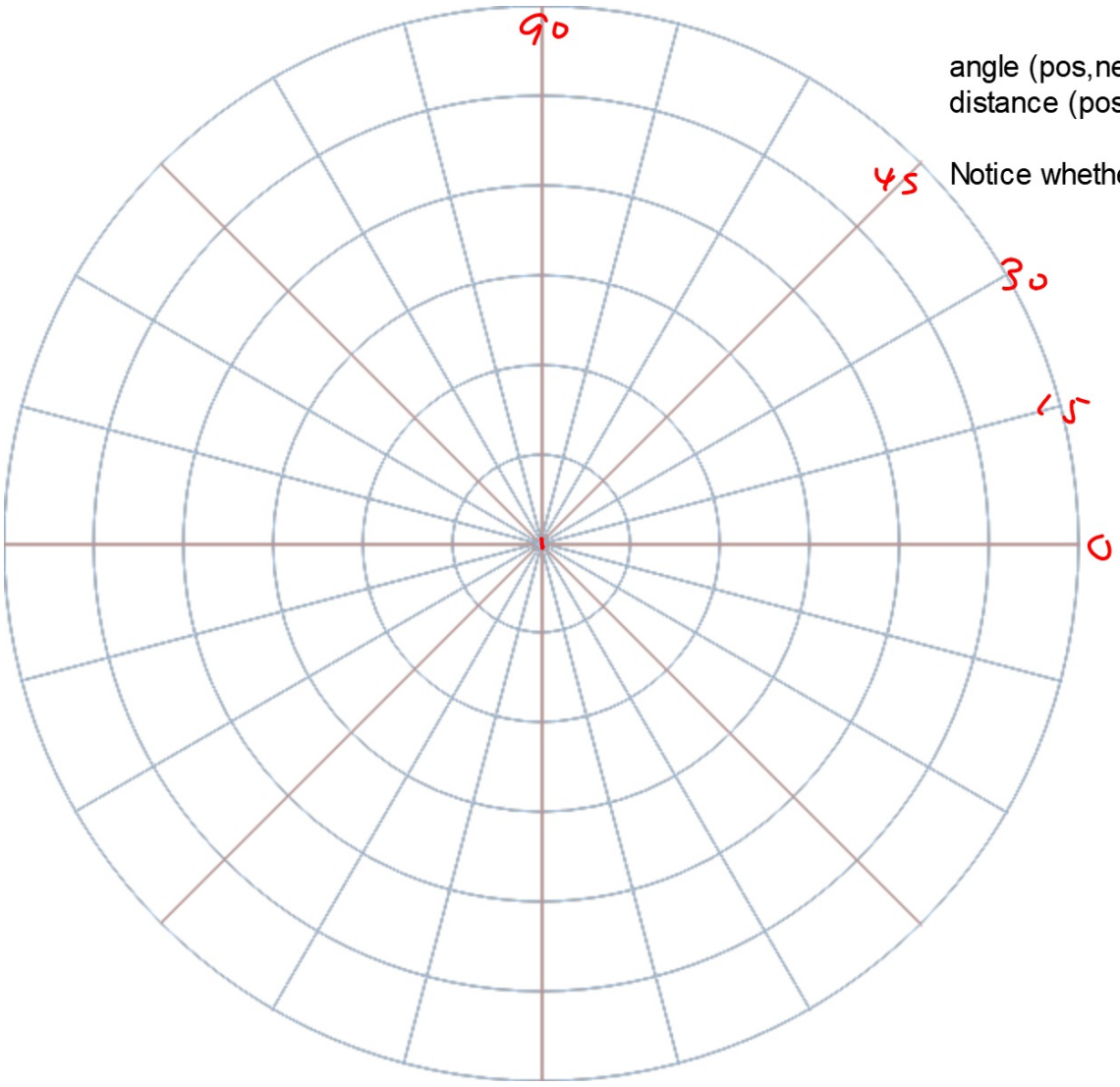
Graph points in polar coordinate form
Graph polar equations
Determine distance between 2 polar coordinates

r

Θ

Law of cosines





angle (pos,neg)
distance (pos, neg)

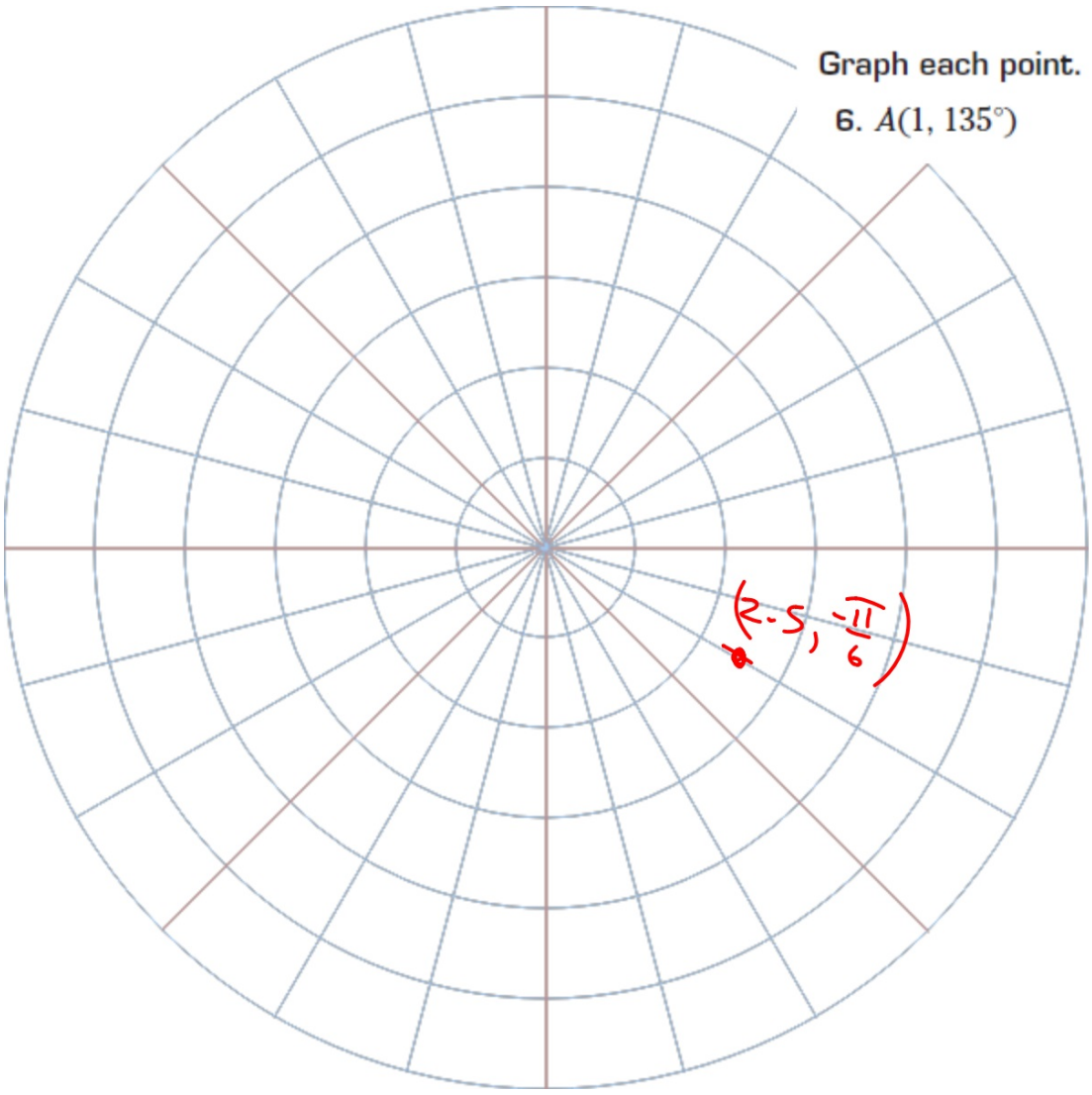
Notice whether r=1 or r=0.5

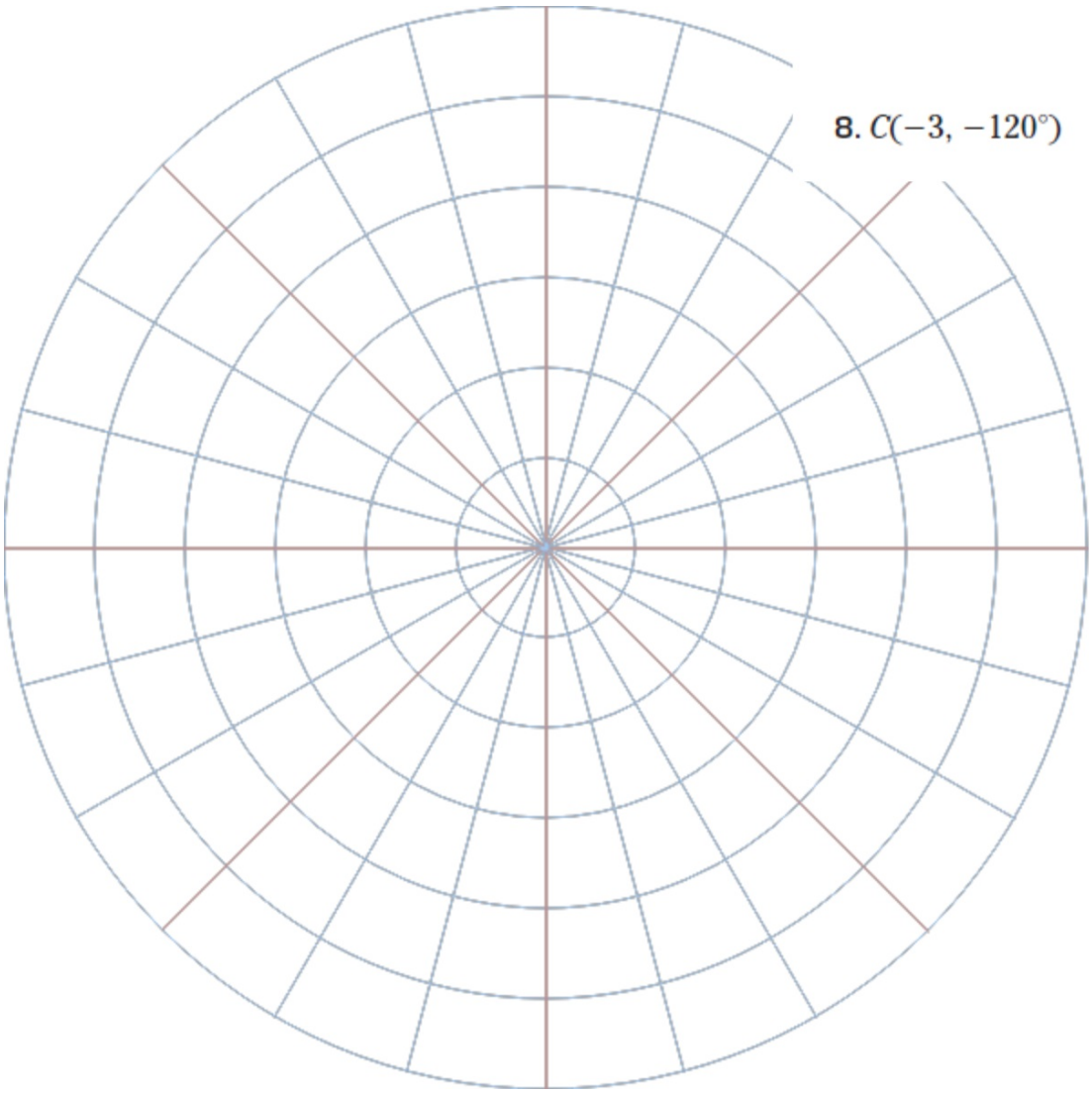
Graph each point.

6. $A(1, 135°)$

7. $B\left(2.5, -\frac{\pi}{6}\right)$

-30





8. $C(-3, -120°)$

9. $D\left(-2, \frac{13\pi}{6}\right)$

Related to Law of cosines

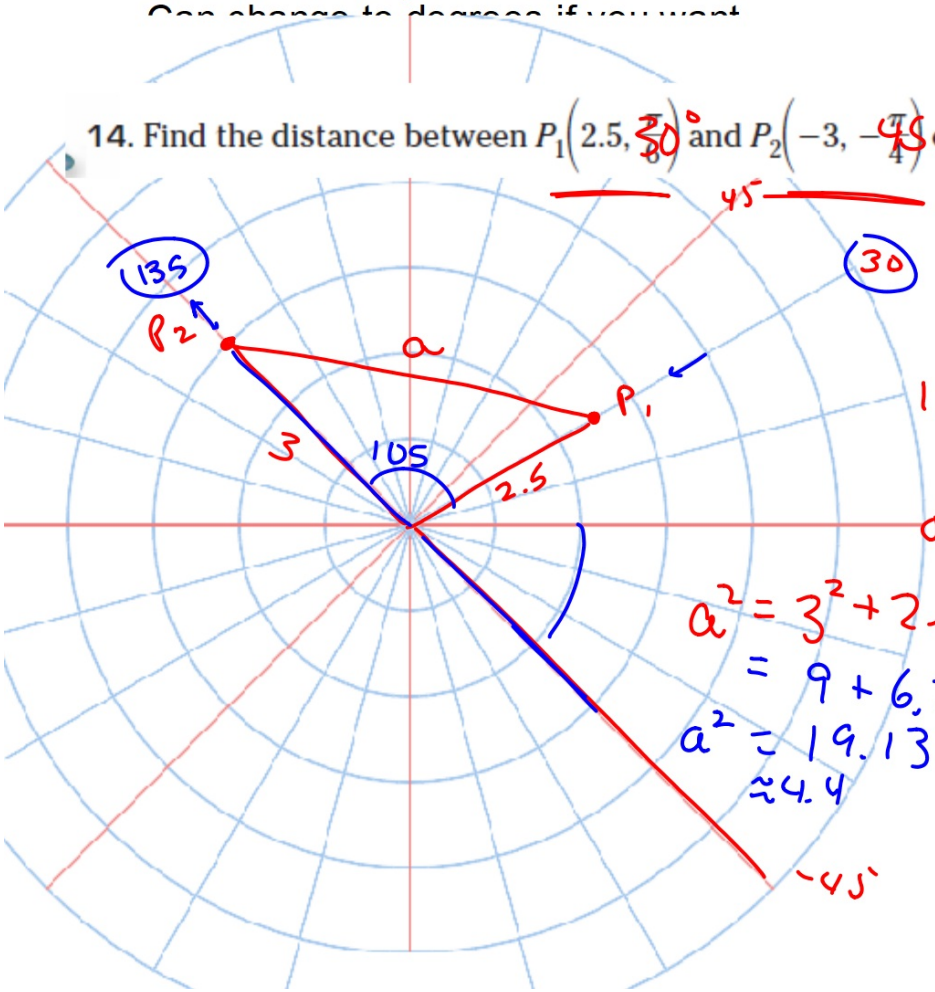
$a^2 = b^2 + c^2 - 2bc\cos A$

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 $P_1P_2 = \sqrt{r_1^2 + r_2^2 - 2r_1r_2\cos(\theta_2 - \theta_1)}$.

Could memorize...

Law of cosines

14. Find the distance between $P_1\left(2.5, \frac{\pi}{6}\right)$ and $P_2\left(-3, -\frac{\pi}{4}\right)$ on the polar plane.

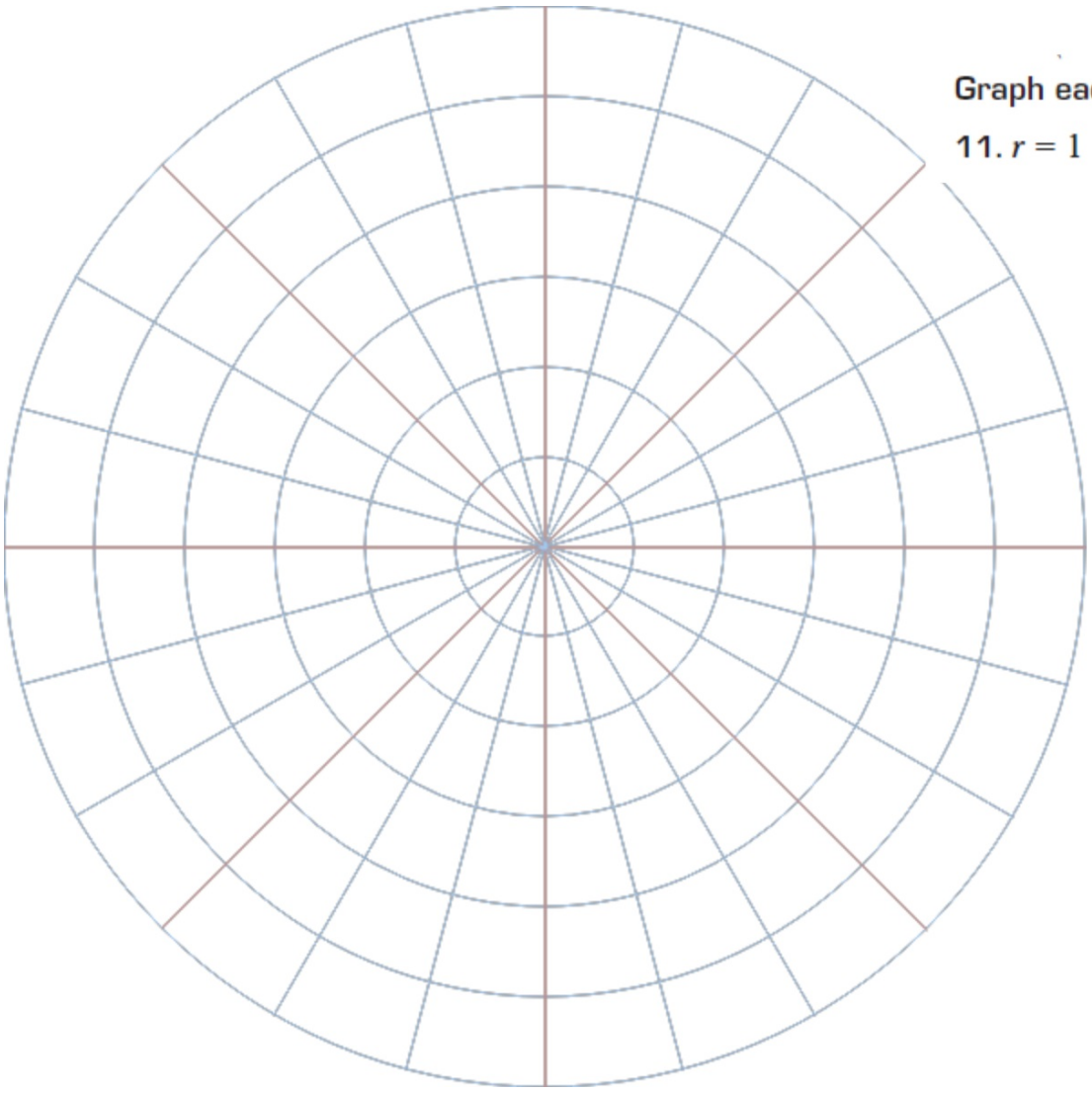


$a^2 = 3^2 + 2.5^2 - 2 \cdot 3 \cdot 2.5 \cdot \cos 105$

$= 9 + 6.25 + 3.88$

$a^2 = 19.13$

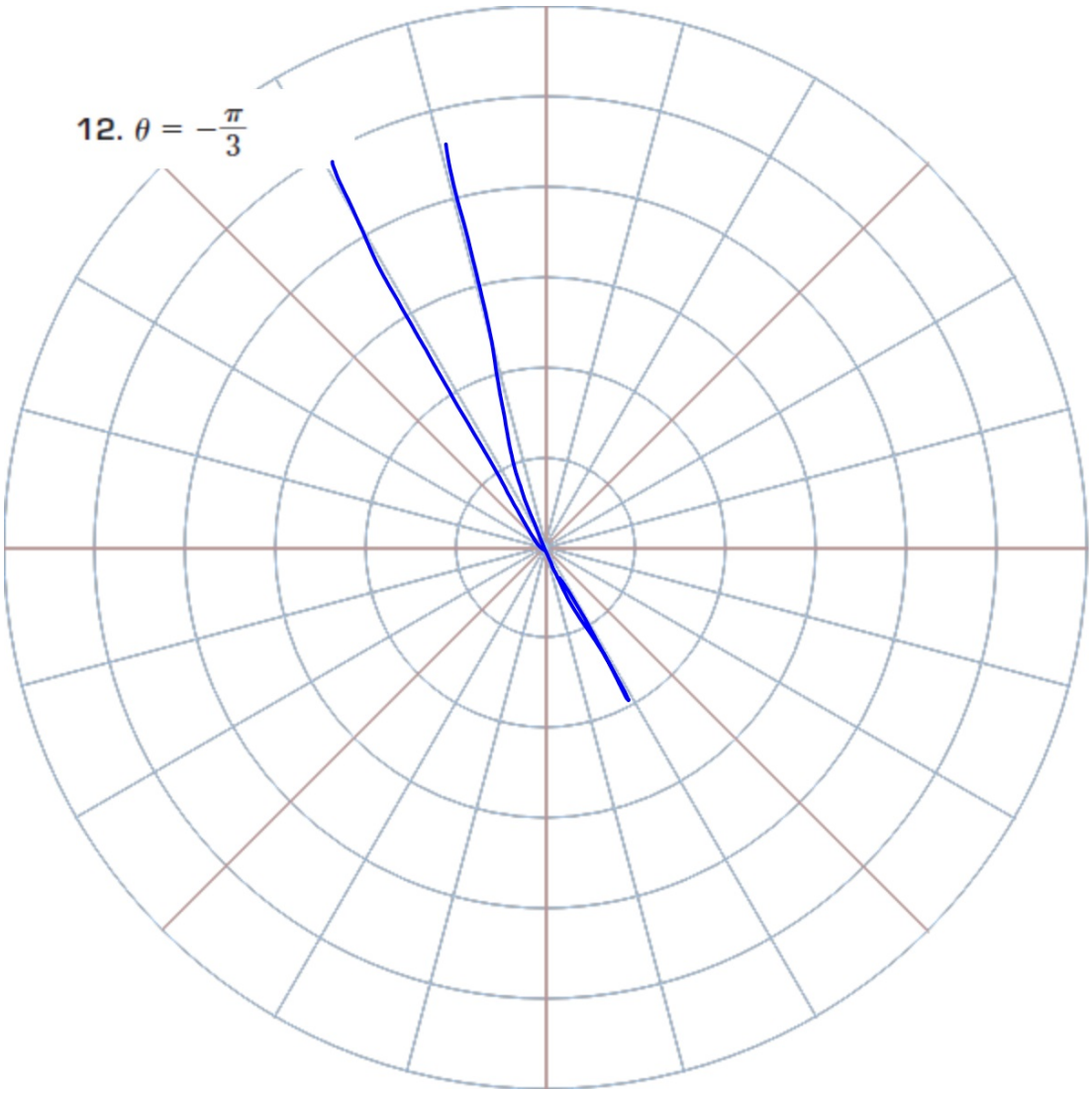
≈ 4.4

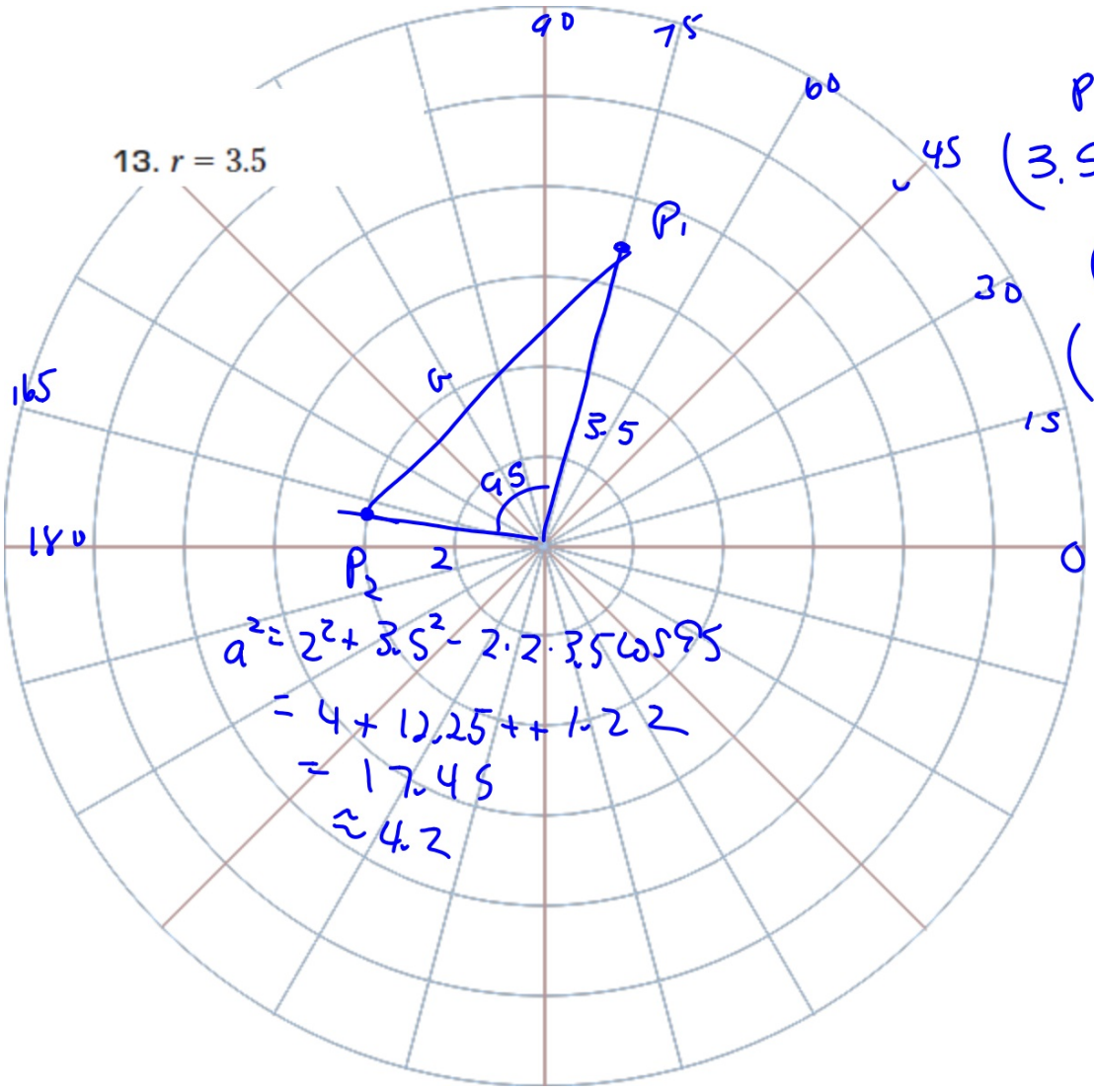


Graph each polar equation.

11. $r = 1$

12. $\theta = -\frac{\pi}{3}$





P_1
$(3.5, 75°)$

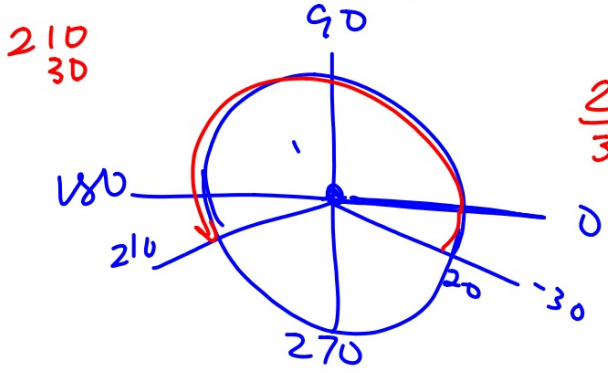
P_2
$(2, 170°)$

$a^2 = 2^2 + 3.5^2 - 2 \cdot 2 \cdot 3.5 \cos 95$
$= 4 + 12.25 + + 1.22$
$= 17.45$
≈ 4.2

15. **Gardening** A lawn sprinkler can cover the part of a circular region determined by the polar inequalities $-30° \le \theta \le 210°$ and $0 \le r \le 20$, where r is measured in feet.

a. Sketch a graph of the region that the sprinkler can cover.

b. Find the area of the region.



πr^2

$\frac{240}{360} \pi \cdot 20^2$

$\approx 838 \text{ ft}^2$

WB 9.1