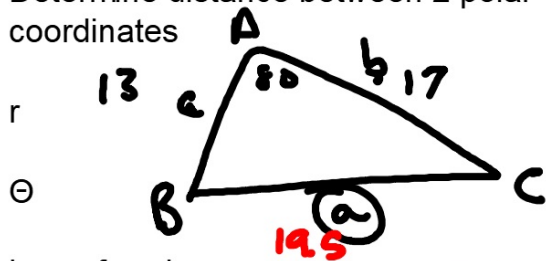


## Trig 9.1

Graph points in polar coordinate form

Graph polar equations

Determine distance between 2 polar coordinates



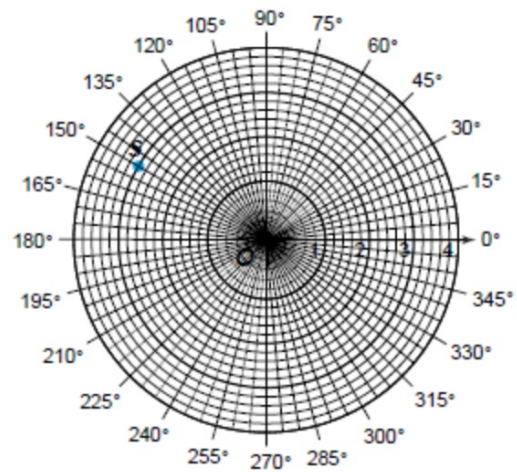
Law of cosines

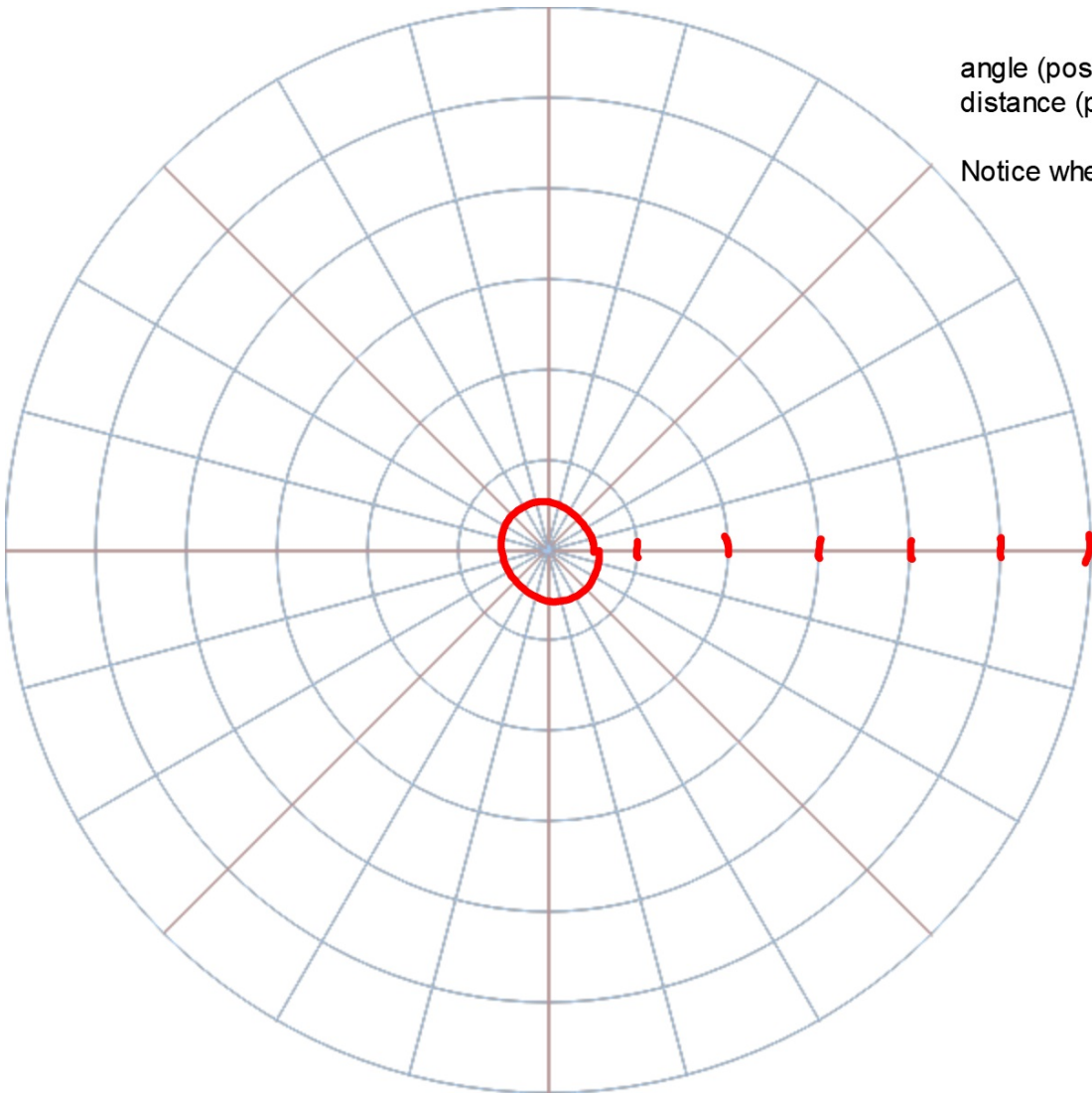
$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$
$$= 13^2 + 17^2 - 2 \cdot 13 \cdot 17 \cos 80^\circ$$

$$= 169 + 289 - 76.752$$

$$= 381.248$$

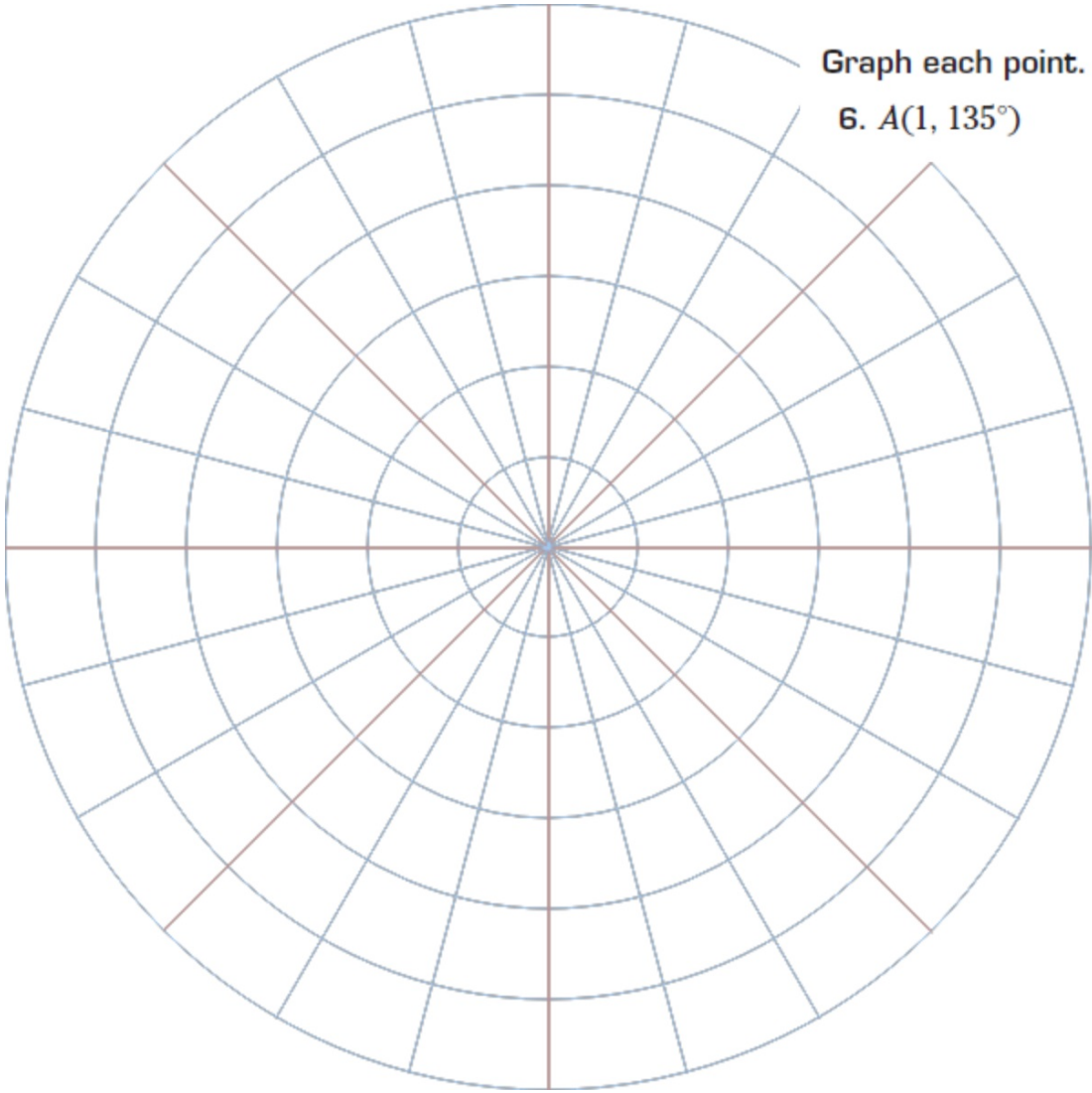
$$a = 19.5$$





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

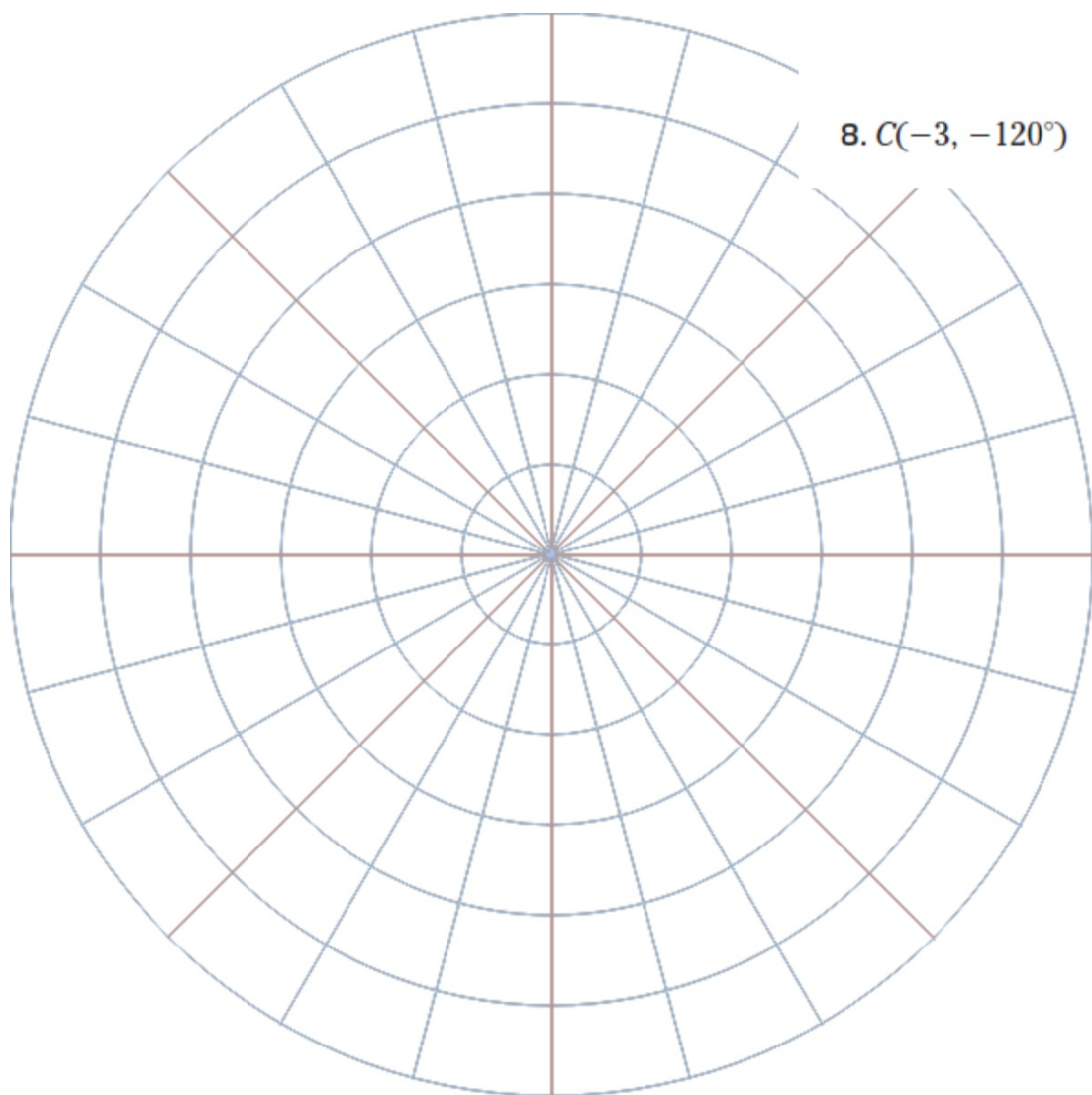
Notice whether  $r=1$  or  $r=0.5$



Graph each point.

6.  $A(1, 135^\circ)$

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



8.  $C(-3, -120^\circ)$

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

Related to Law of cosines

Distance  
Formula in  
Polar Plane

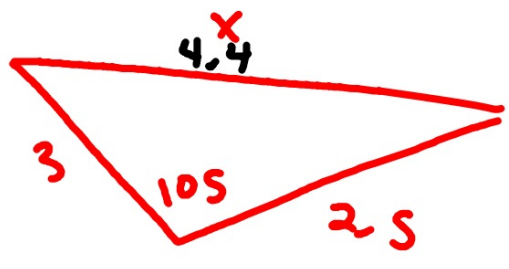
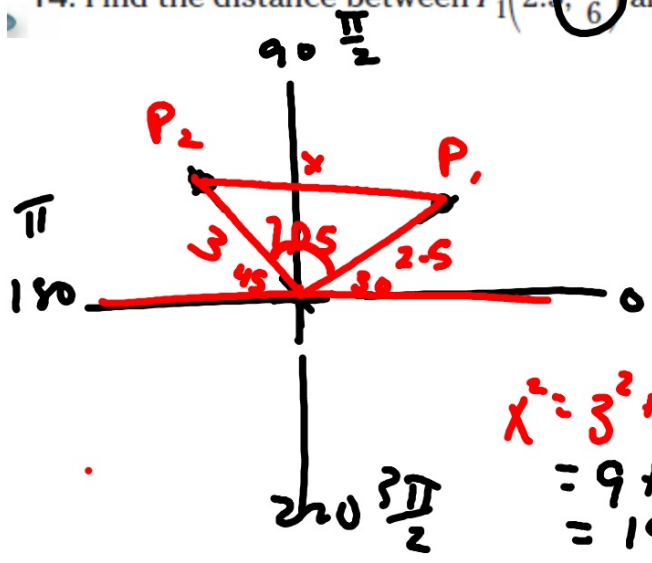
If  $P_1(r_1, \theta_1)$  and  $P_2(r_2, \theta_2)$  are two points in the polar plane, then

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

Could memorize...

Law of cosines ~~105~~

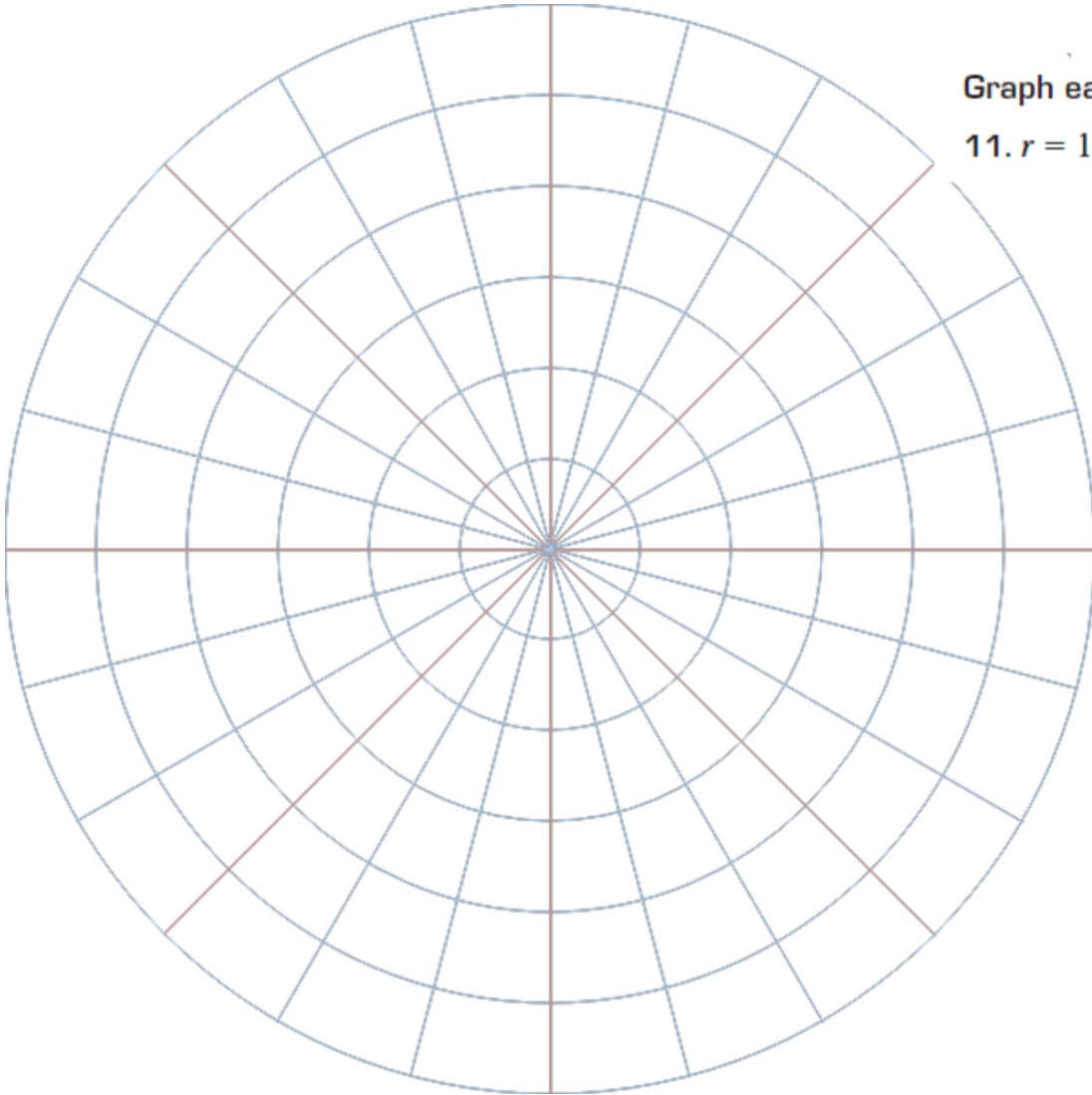
14. Find the distance between  $P_1(2.5, \frac{\pi}{6})$  and  $P_2(-3, -\frac{\pi}{4})$  on the polar plane.



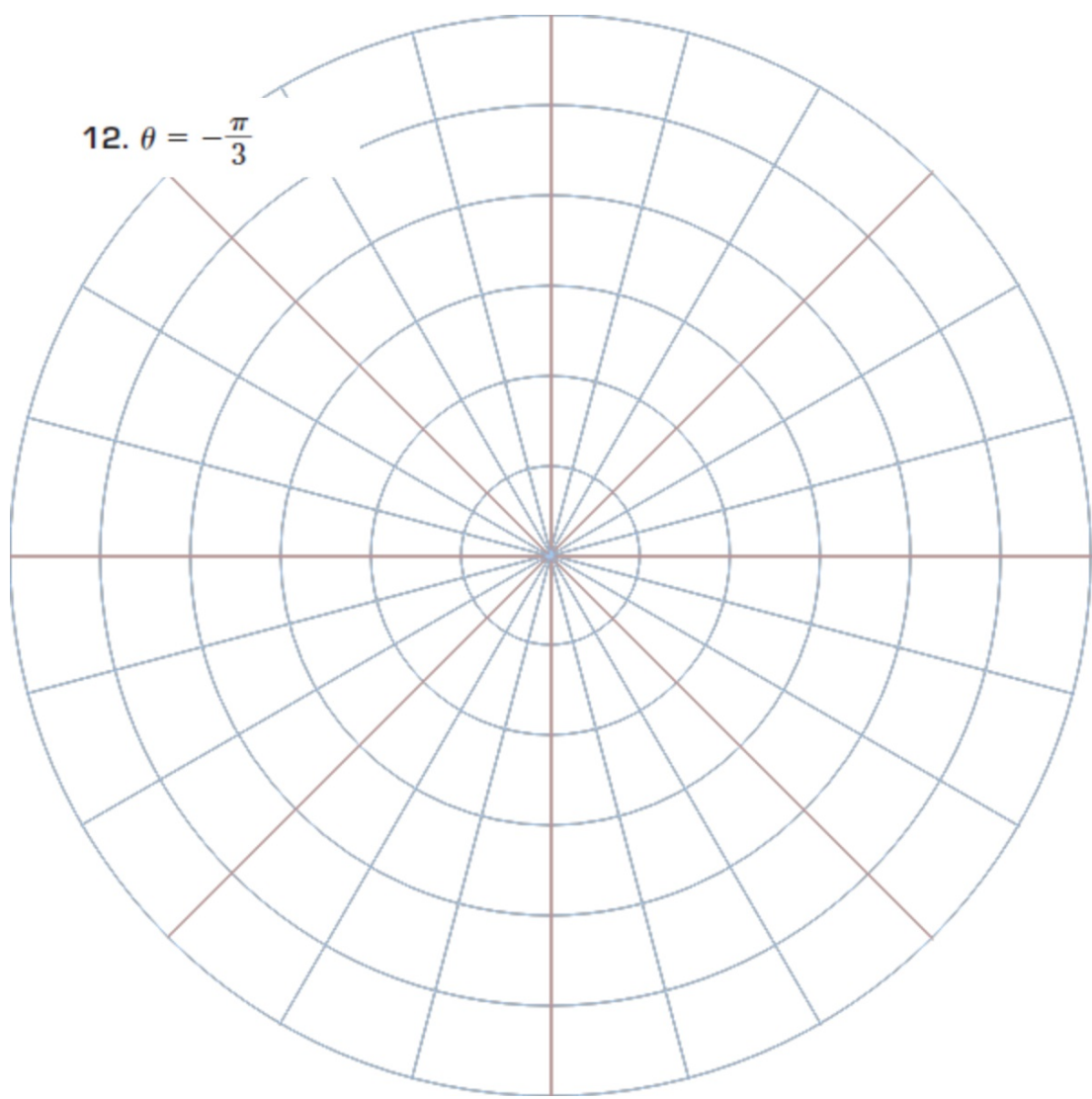
$$\begin{aligned}
 x^2 &= 3^2 + 2.5^2 - 2 \cdot 3 \cdot 2.5 \cos 105 \\
 &= 9 + 6.25 - 3.882 \\
 &= 19.132
 \end{aligned}$$

Graph each polar equation.

11.  $r = 1$

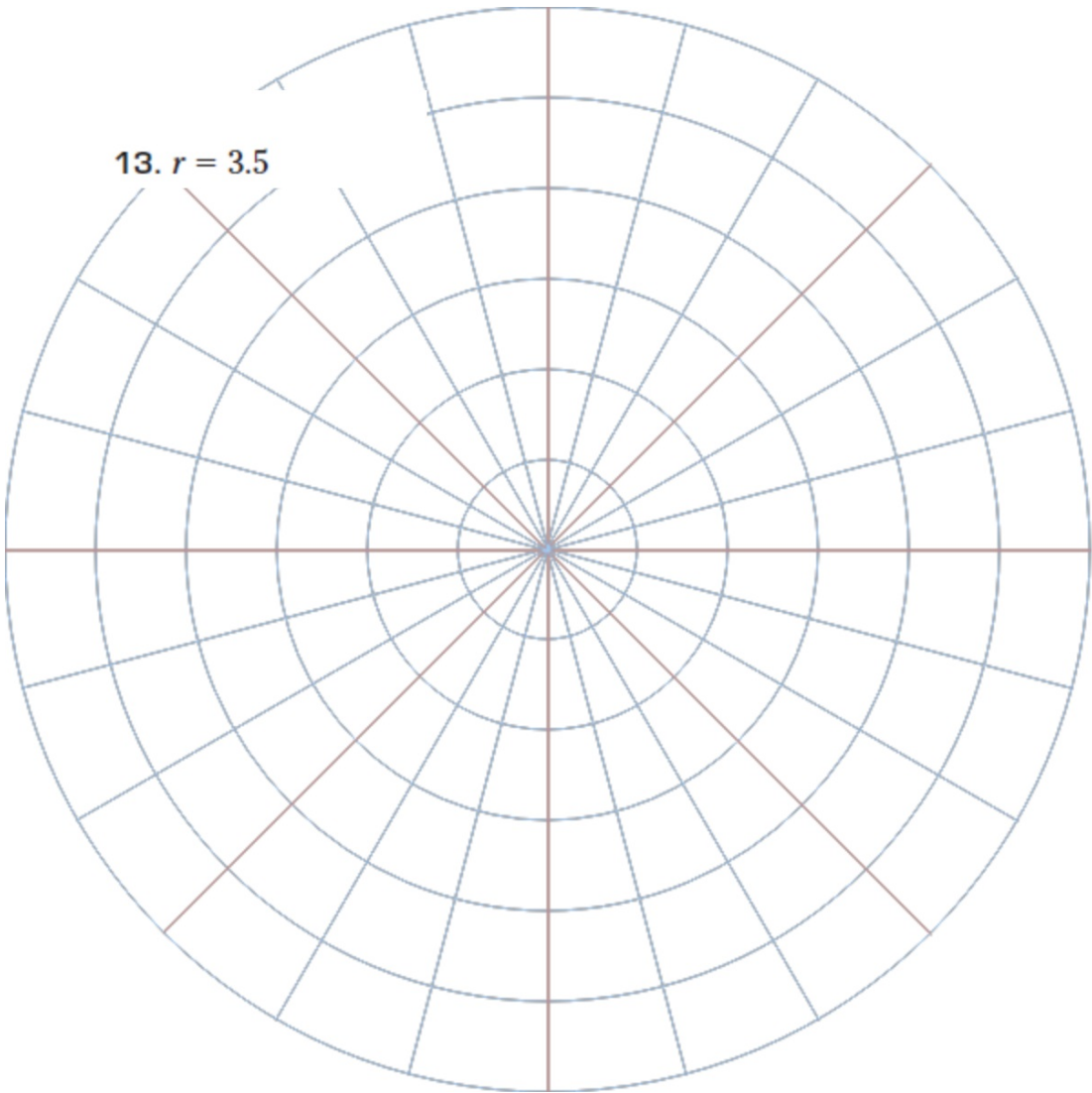


12.  $\theta = -\frac{\pi}{3}$



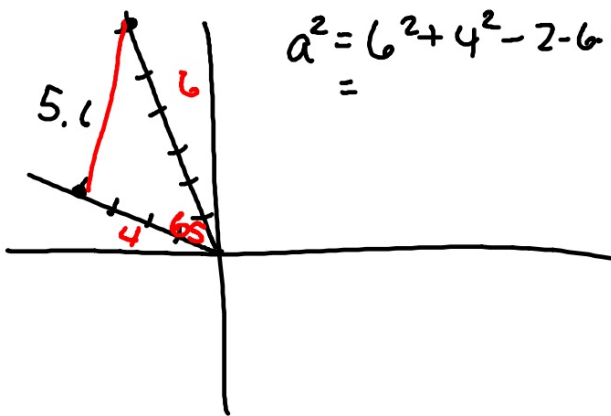


13.  $r = 3.5$



15. **Gardening** A lawn sprinkler can cover the part of a circular region determined by the polar inequalities  $-30^\circ \leq \theta \leq 210^\circ$  and  $0 \leq r \leq 20$ , where  $r$  is measured in feet.
- Sketch a graph of the region that the sprinkler can cover.
  - Find the area of the region.

(4, 170°) (6, 105°)



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

