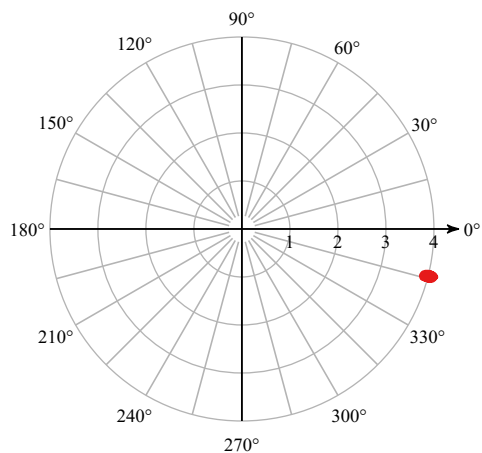


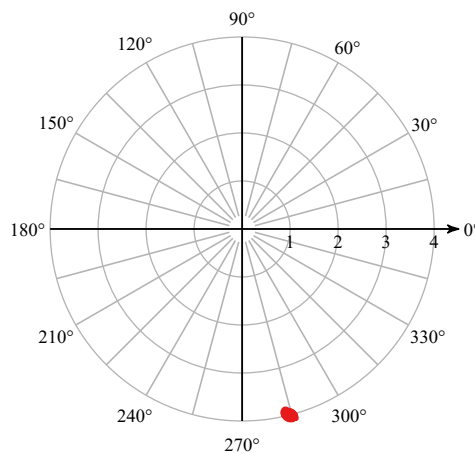
Intro to Polar Form Notes

Plot the point with the given polar coordinates.

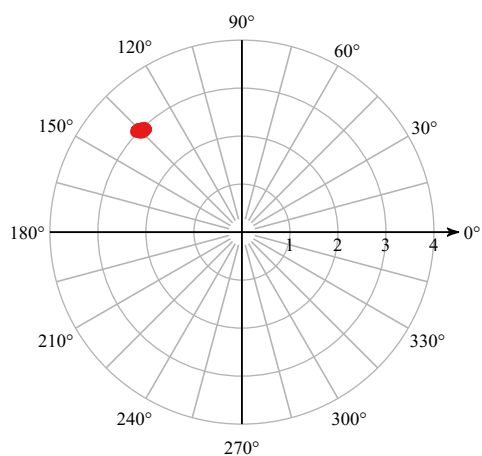
1) $(4, 345^\circ)$



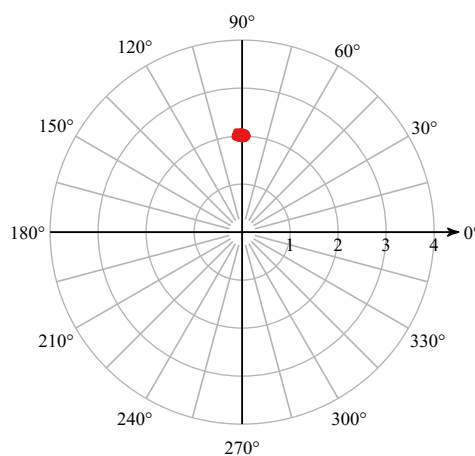
2) $(4, 285^\circ)$



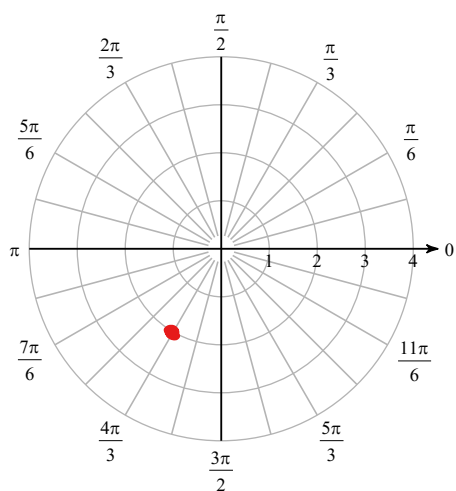
3) $(3, -225^\circ)$



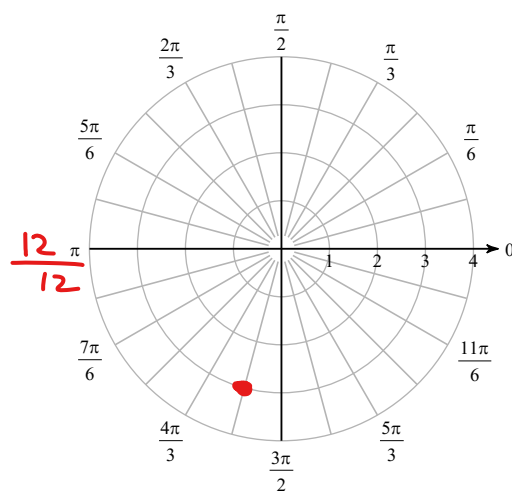
4) $(-2, 270^\circ)$



5) $\left(-2, -\frac{5\pi}{3}\right)$

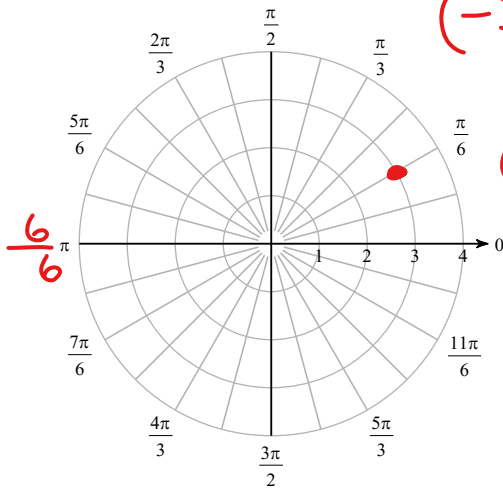


6) $\left(3, -\frac{7\pi}{12}\right)$

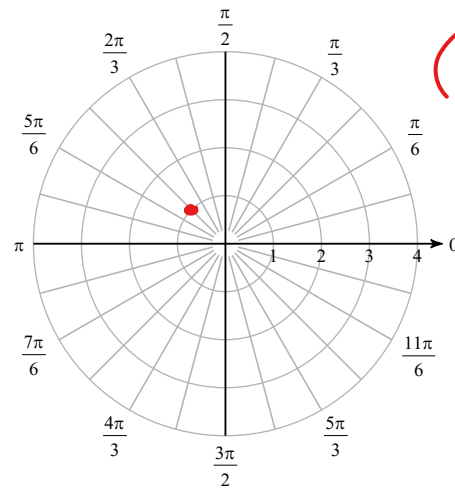


Find 3 other polar coordinates that describe the same point as the provided polar coordinates.

7) $(3, -\frac{11\pi}{6})$ $(3, \frac{\pi}{6})$



8) $(-1, -\frac{\pi}{4})$ $(1, \frac{3\pi}{4})$



Convert each pair of polar coordinates to rectangular coordinates.

9) $(4, -\frac{11\pi}{6})$

$x = r \cos \theta \rightarrow x = 4 \cos(-\frac{11\pi}{6})$
 $x = 4(\frac{\sqrt{3}}{2}) = 2\sqrt{3}$

$y = r \sin \theta \Rightarrow y = 4 \sin(-\frac{11\pi}{6})$
 $y = 4(\frac{1}{2}) = 2$
 $(x, y) = (2\sqrt{3}, 2)$

10) $(-2, \frac{4\pi}{3})$

$x = r \cos \theta \rightarrow x = -2 \cos(\frac{4\pi}{3})$
 $= -2(-\frac{1}{2}) = 1$

$y = r \sin \theta \rightarrow y = -2 \sin(\frac{4\pi}{3})$
 $y = -2(-\frac{\sqrt{3}}{2}) = \sqrt{3}$
 $(x, y) = (1, \sqrt{3})$

Convert each pair of rectangular coordinates to polar coordinates where $r > 0$ and $0 \leq \theta < 2\pi$.

11) $(-2, 2\sqrt{3})$

$x^2 + y^2 = r^2$
 $(-2)^2 + (2\sqrt{3})^2 = r^2$
 $4 + 12 = r^2$
 $16 = r^2 \rightarrow r = 4$

$\tan^{-1}(\frac{y}{x}) = \theta$
 $\tan^{-1}(\frac{2\sqrt{3}}{-2}) = \theta$
 $\tan^{-1}(-\sqrt{3}) = \theta$
 $\theta = \frac{2\pi}{3}$
 $(r, \theta) = (4, \frac{2\pi}{3})$

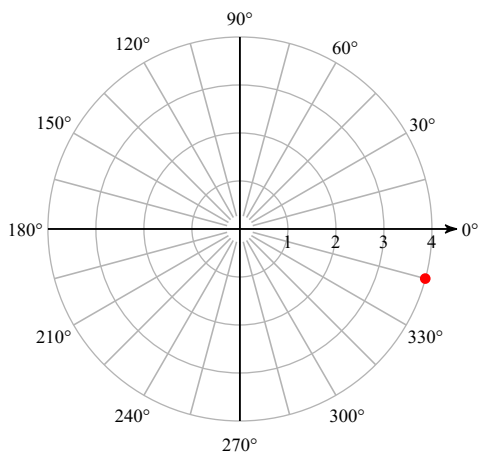
12) $(-\frac{3\sqrt{3}}{2}, -\frac{3}{2})$

$(-\frac{3\sqrt{3}}{2})^2 + (-\frac{3}{2})^2 = r^2$
 $\frac{27}{4} + \frac{9}{4} = \frac{36}{4} = 9 = r^2 \rightarrow r = 3$
 $\tan^{-1}(\frac{-3/2}{-3\sqrt{3}/2}) \rightarrow \tan^{-1}(\frac{1}{\sqrt{3}}) \theta = \frac{7\pi}{6}$
 $(r, \theta) = (3, \frac{7\pi}{6})$

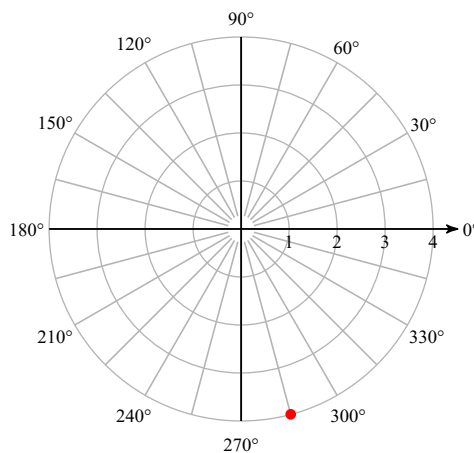
Intro to Polar Form Notes

Plot the point with the given polar coordinates.

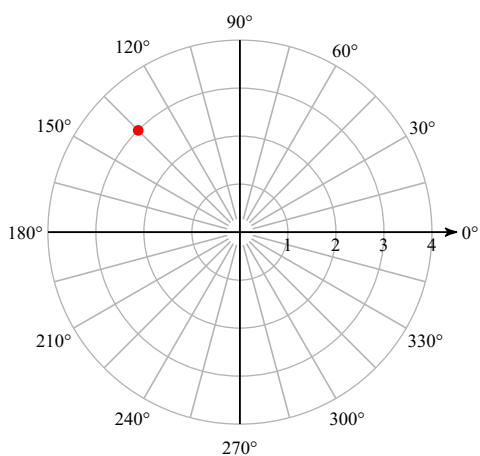
1) $(4, 345^\circ)$



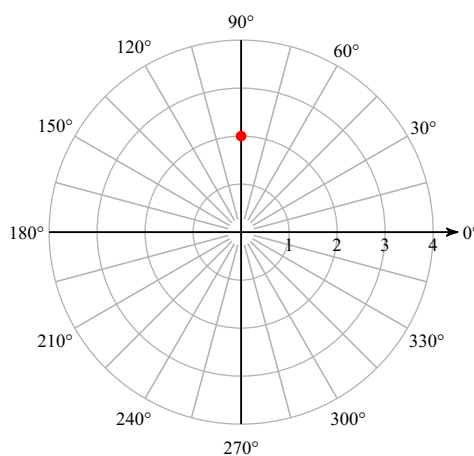
2) $(4, 285^\circ)$



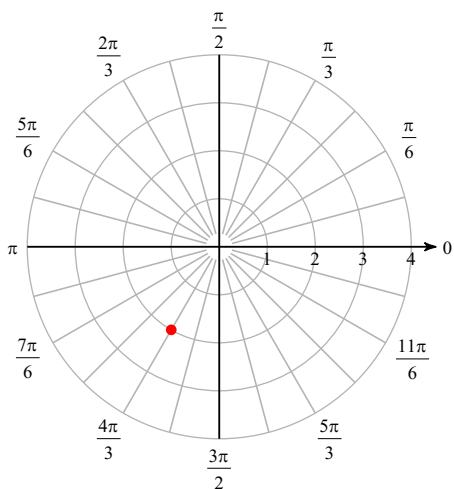
3) $(3, -225^\circ)$



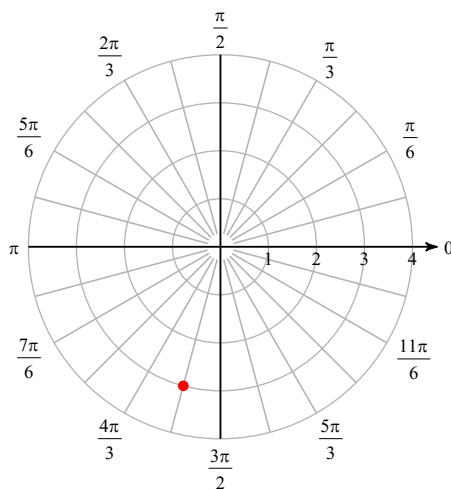
4) $(-2, 270^\circ)$



5) $\left(-2, -\frac{5\pi}{3}\right)$

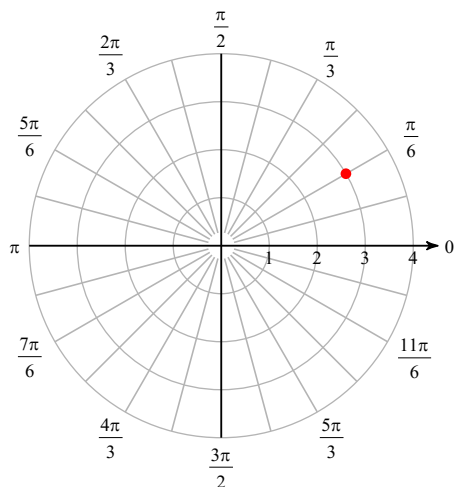


6) $\left(3, -\frac{7\pi}{12}\right)$



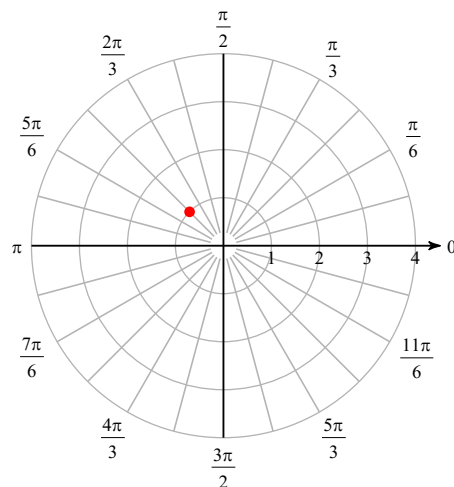
Find 3 other polar coordinates that describe the same point as the provided polar coordinates.

7) $\left(3, -\frac{11\pi}{6}\right)$



$\left(3, -\frac{11\pi}{6} + 2n\pi\right)$ and $\left(-3, -\frac{11\pi}{6} + (2n+1)\pi\right)$
where n is an integer

8) $\left(-1, -\frac{\pi}{4}\right)$



$\left(-1, -\frac{\pi}{4} + 2n\pi\right)$ and $\left(1, -\frac{\pi}{4} + (2n+1)\pi\right)$
where n is an integer

Convert each pair of polar coordinates to rectangular coordinates.

9) $\left(4, -\frac{11\pi}{6}\right)$

$(2\sqrt{3}, 2)$

10) $\left(-2, \frac{4\pi}{3}\right)$

$(1, \sqrt{3})$

Convert each pair of rectangular coordinates to polar coordinates where $r > 0$ and $0 \leq \theta < 2\pi$.

11) $(-2, 2\sqrt{3})$

$\left(4, \frac{2\pi}{3}\right)$

12) $\left(-\frac{3\sqrt{3}}{2}, -\frac{3}{2}\right)$

$\left(3, \frac{7\pi}{6}\right)$