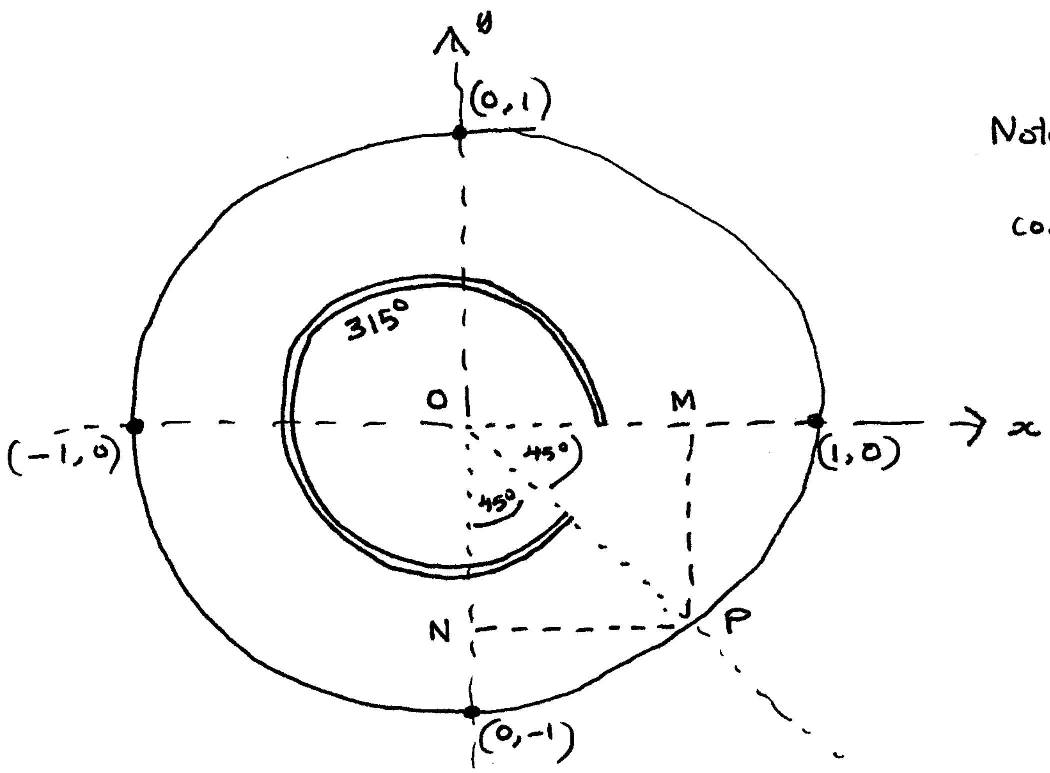

Note that $\frac{7\pi}{4}$ corresponds to 315°

By definition, $\cos\left(\frac{7\pi}{4}\right)$ is the projection of OP onto the positive x-axis. So its magnitude is $OM = OP\cos(45^\circ)$ $= 1\cdot\cos(45^\circ) = \cos(45^\circ)$, and its sign is positive. That is,

$$\cos\left(\frac{7\pi}{4}\right) = +\cos(45^\circ) = \frac{1}{\sqrt{2}} \quad (= OM)$$

Similarly, $\sin\left(\frac{7\pi}{4}\right)$ is the projection of OP onto the positive y-axis. So its magnitude is $ON = OP\cos(45^\circ)$ $= 1\cdot\cos(45^\circ) = \cos(45^\circ)$, but its sign is negative, because the positive y-axis goes up and ON goes down. That is,

$$\sin\left(\frac{7\pi}{4}\right) = -\cos(45^\circ) = -\frac{1}{\sqrt{2}} \quad (= -ON)$$

And how do you know that $OM = ON = \frac{1}{\sqrt{2}}$? Because Pythagoras says

$$OM^2 + MP^2 = OP^2$$
$$\Rightarrow OM^2 + ON^2 = 1^2 \quad (ON = MP)$$
$$\Rightarrow 2OM^2 = 1 \quad (OM = ON)$$
$$\Rightarrow OM^2 = \frac{1}{2} \Rightarrow OM = \frac{1}{\sqrt{2}} \quad (OM > 0)$$
$$\Rightarrow ON = \frac{1}{\sqrt{2}} \text{ as well}$$