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

\[
= 1 \cdot \cos(45^\circ) = \cos(45^\circ), \text{ and its sign is positive. That is,} \]

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

Similarly, \( \sin \left( \frac{7\pi}{4} \right) \) is the projection of \( OP \) onto the positive \( y \)-axis. So its magnitude is \( ON = OP \cos(45^\circ) \)

\[
= 1 \cdot \cos(45^\circ) = \cos(45^\circ), \text{ but its sign is negative, because the positive } y \text{-axis goes up and } ON \text{ goes down. That is,} \]

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

And how do you know that \( OM = ON = \frac{1}{\sqrt{2}} \)? Because

Pythagoras says

\[
OM^2 + MP^2 = OP^2
\]

\[
\Rightarrow OM^2 + ON^2 = 1^2 \quad (ON = MP)
\]

\[
\Rightarrow 2OM^2 = 1 \quad (OM = ON)
\]

\[
\Rightarrow OM^2 = \frac{1}{2} \Rightarrow OM = \frac{1}{\sqrt{2'}} \quad (OM > 0)
\]

\[
\Rightarrow ON = \frac{1}{\sqrt{2'}} \text{ as well}
\]