

A particle is at point Q(-12, -5). Find the unit vector along OQ.

Solution: The position vector \overrightarrow{OQ} of the particle will have the same coordinates as the point Q, because its starting point is at the coordinate origin, and it will be: $\overrightarrow{OQ} = -12i - 5j$.

Magnitude of the position vector is: $|\overrightarrow{OQ}| = \sqrt{(-12)^2 + (-5)^2} = \sqrt{(-12)^2 + (-5)^2} = \sqrt{169} = 13$.

And the unit vector along OQ will be: $\hat{u} = -\frac{12}{13}i - \frac{5}{13}j$.