

Answer on Question #42008 – Math – Trigonometry

A vector w of magnitude 50 points southeast. Resolve the vector into southerly and easterly components.

- a) The southerly component has a magnitude of ____.
- b) What is the length?

Solution.

Let input a Cartesian coordinate system with X -axis along the south and Y -axis along the east. The given vector will be with $\vec{w}(w\cos\alpha; w\sin\alpha)$, there $w = 50$ is the magnitude of the vector and $\alpha = 45^0$ is the angle between the vector and X -axis.

- a) The southerly component has a magnitude of $|w\cos\alpha| = |50 \cdot \cos 45^0| = 50 \cdot \frac{\sqrt{2}}{2} = 25\sqrt{2}$ points.
- b) The projection of the southerly component is $w\cos\alpha = 50 \cdot \cos 45^0 = 25\sqrt{2}$.

Answer: a) $25\sqrt{2}$; b) $25\sqrt{2}$.