## Answer on Question 64216, Physics, Astronomy, Astrophysics Question:

Vector $A$ has a magnitude of $35.1 \mathrm{~m} / \mathrm{s}$ and a direction of 215 degrees. What are its $x$ and $y$-components?

## Solution:



We can find $x$ - and $y$-components of vector $A$ from the geometry:

$$
\begin{aligned}
A_{x} & =A \cos \theta, \\
A_{y} & =A \sin \theta,
\end{aligned}
$$

here, $A$ is the magnitude of the vector, $\theta$ is the angle that vector $A$ makes with the positive $x$-axis.

Then, we can calculate $A_{x}$ and $A_{y}$ (since vector $A$ lies in the third quadrant its $x$ - and $y$-components will be negative as shown in figure above):

$$
\begin{aligned}
& A_{x}=A \cos \theta=35.1 \frac{\mathrm{~m}}{\mathrm{~s}} \cdot \cos 215^{\circ}=-28.75 \frac{\mathrm{~m}}{\mathrm{~s}} . \\
& A_{y}=A \sin \theta=35.1 \frac{\mathrm{~m}}{\mathrm{~s}} \cdot \sin 215^{\circ}=-20.13 \frac{\mathrm{~m}}{\mathrm{~s}} .
\end{aligned}
$$

## Answer:

$A_{x}=-28.75 \frac{\mathrm{~m}}{\mathrm{~s}}, A_{y}=-20.13 \frac{\mathrm{~m}}{\mathrm{~s}}$.

