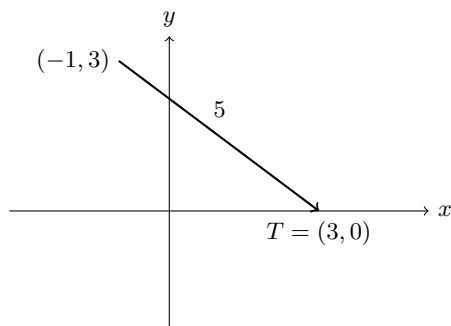


Question 5

A vector $\vec{u}$ begins at $(-1, 3)$ and ends somewhere on the positive x -axis. If $\|\vec{u}\| = 5$, find every possible terminal point.

Question 5 – Solution

Strategy Identify the initial and terminal information first. Build the vector by subtracting coordinates, then use the magnitude formula or normalize only after the components are correct.



Step 1 Write the terminal point as $T = (t, 0)$ with $t > 0$. Then $\vec{u} = \langle t + 1, -3 \rangle$.

Step 2 The length condition gives $(t + 1)^2 + 9 = 25$, hence $t + 1 = \pm 4$.

Step 3 The candidates are $t = 3, -5$; positivity leaves $\boxed{T = (3, 0)}$.

Verification The result follows from the defining vector formulas used above, and each component, magnitude, or scalar condition has been checked against the information in the question.

Key idea A vector separates two ideas: its components describe displacement, while its magnitude and unit vector describe size and direction. Always check signs and confirm that a unit vector has magnitude 1.