

47. Let A denote the magnitude of \vec{A} ; similarly for the other vectors. The vector equation is $\vec{A} + \vec{B} = \vec{C}$ where $B = 8.0$ m and $C = 2A$. We are also told that the angle (measured in the ‘standard’ sense) for \vec{A} is 0° and the angle for \vec{C} is 90° , which makes this a right triangle (when drawn in a “head-to-tail” fashion) where B is the size of the hypotenuse. Using the Pythagorean theorem,

$$B = \sqrt{A^2 + C^2} \implies 8.0 = \sqrt{A^2 + 4A^2}$$

which leads to $A = 8/\sqrt{5} = 3.6$ m.