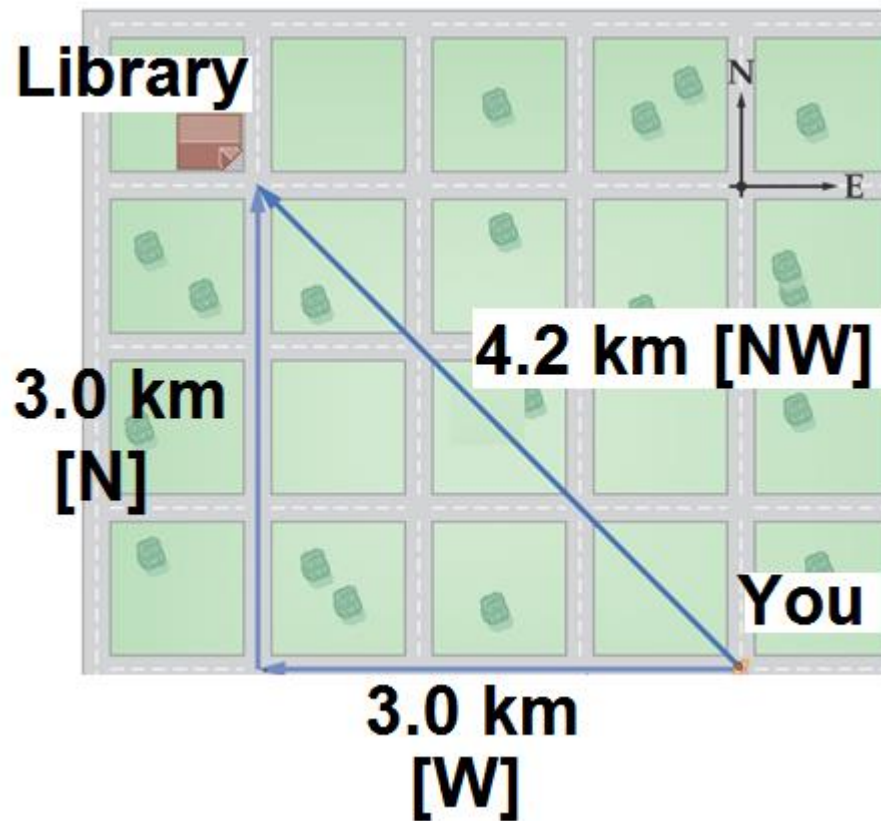


# Using Components 2D Vector Analysis

- **The Components of a Vector**
- **Adding and Subtracting Vectors using components**

# The Components of a Vector

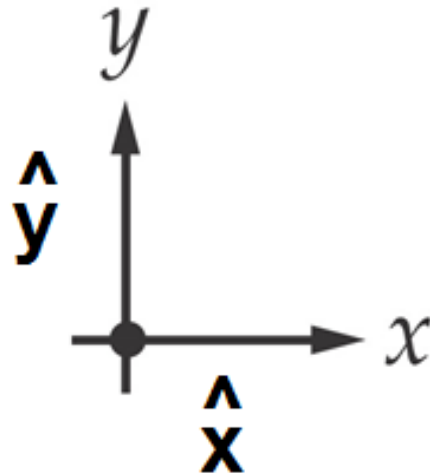
Consider the diagram below: The library is 4.2 km [NW] of your location. How will you get there?



# Cartesian Components:

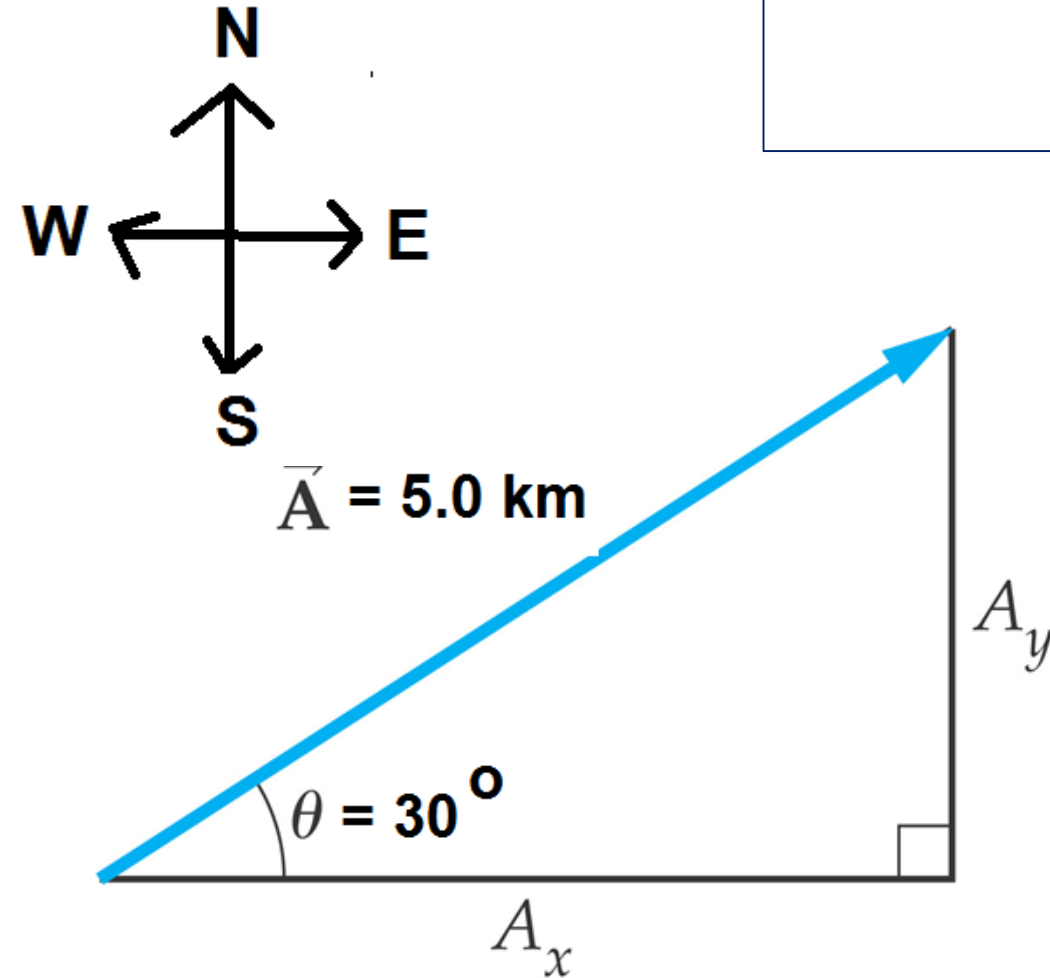
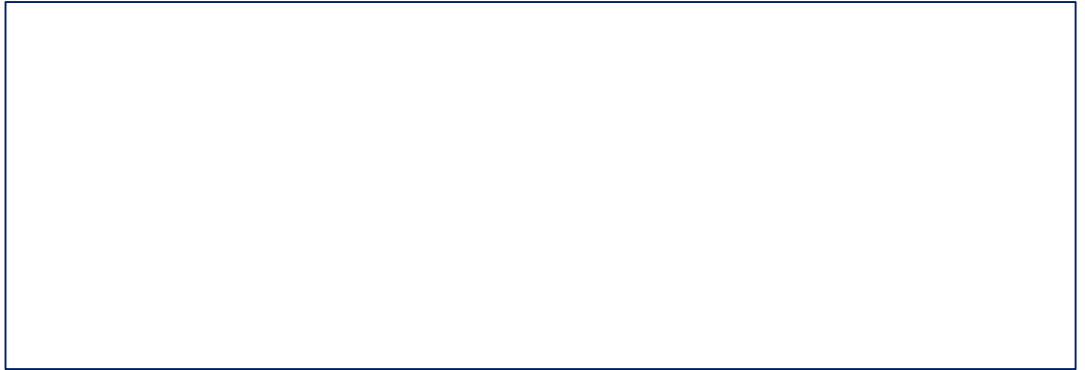
In a 2D plane, we can define a co-ordinate system made up of 2 orthogonal

(\_\_\_\_\_) unit vectors:



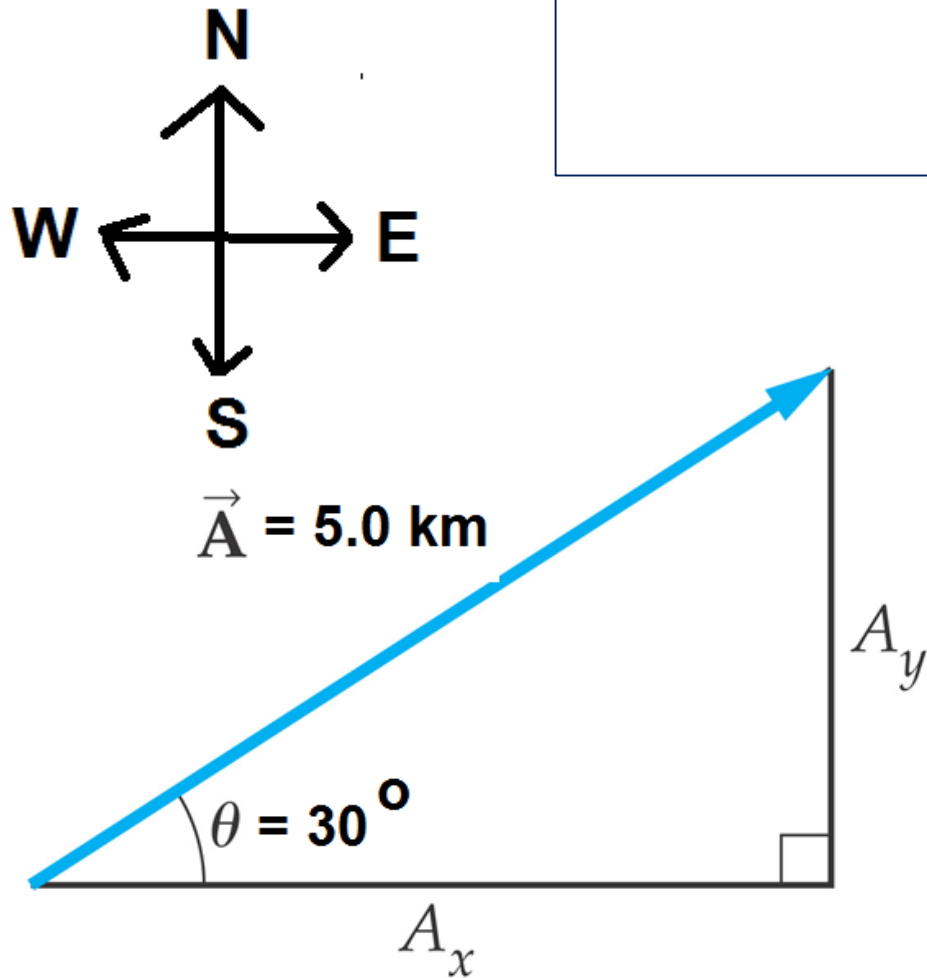
We can \_\_\_\_\_ or \_\_\_\_\_ any vector in a 2D plane into \_\_\_\_\_ in each unit vector direction:

Position vector Vector A can be written two ways:



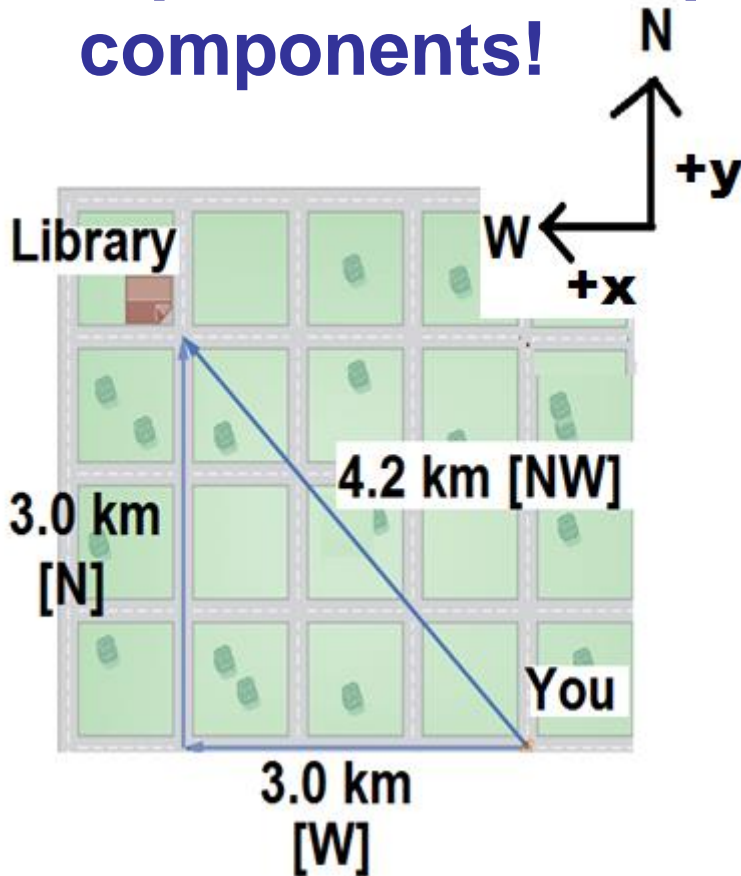
We can find the values of  $A_x$  and  $A_y$  using Trig!

$$\vec{A} = A_x \hat{x} + A_y \hat{y}$$



# The Components of a Vector

Back to the library displacement! We can represent the displacement using components!



# **Adding vectors using components!**

**Find the x and y components for each vector:**

**Add up all of the x and y components:**

Sketch the total x and y components and use Pythagorean Theorem & SOHCAHTOA to write in magnitude angle form.

