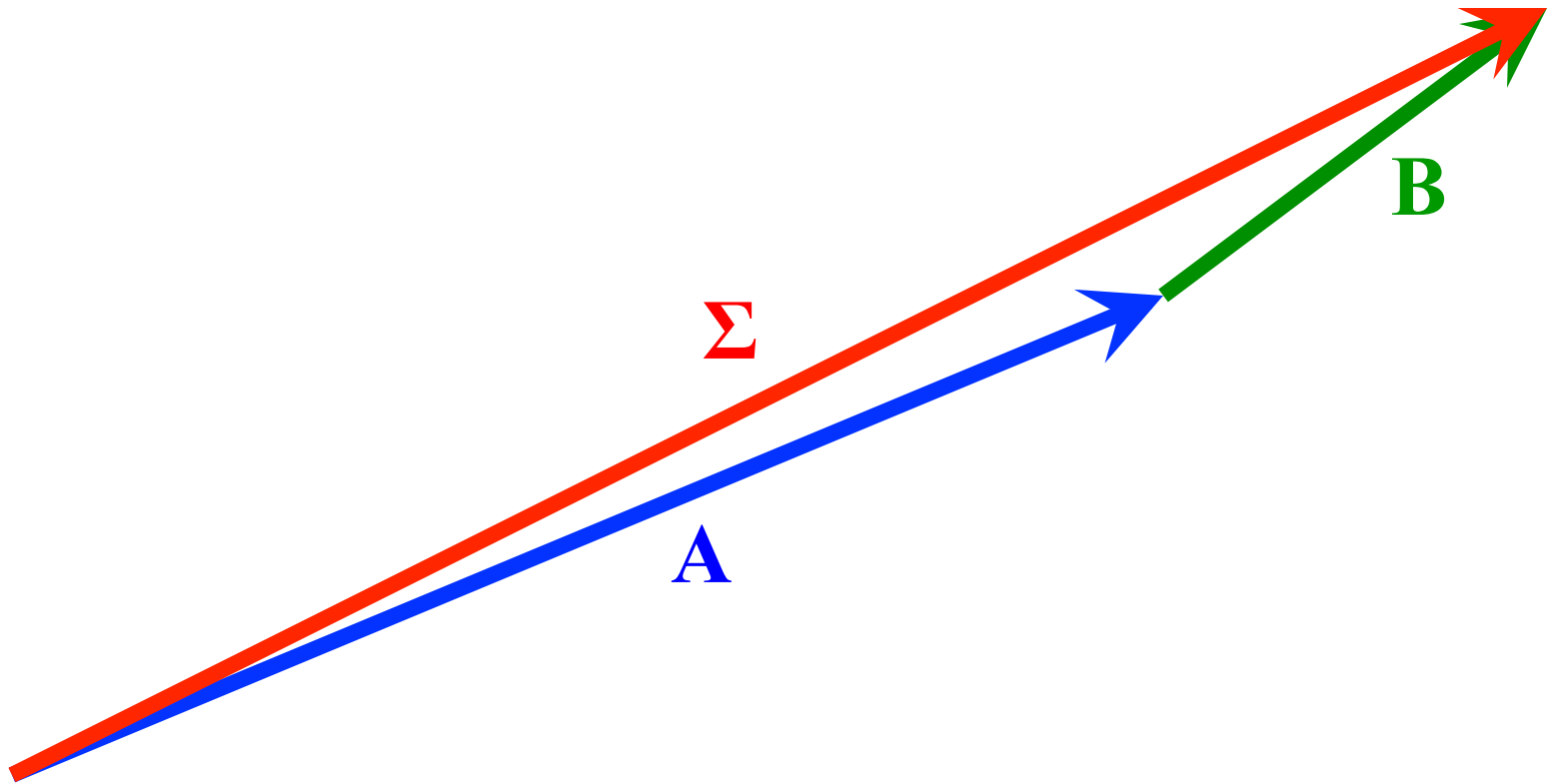


Vectors – 2-D Kinematics

- I. Vector Addition/Subtraction
 - Graphical
- II. Vector Components
 - Applications
- III. Vector Addition/Subtraction**
 - Numerical**
- IV. Relative Motion
- V. Projectile Motion

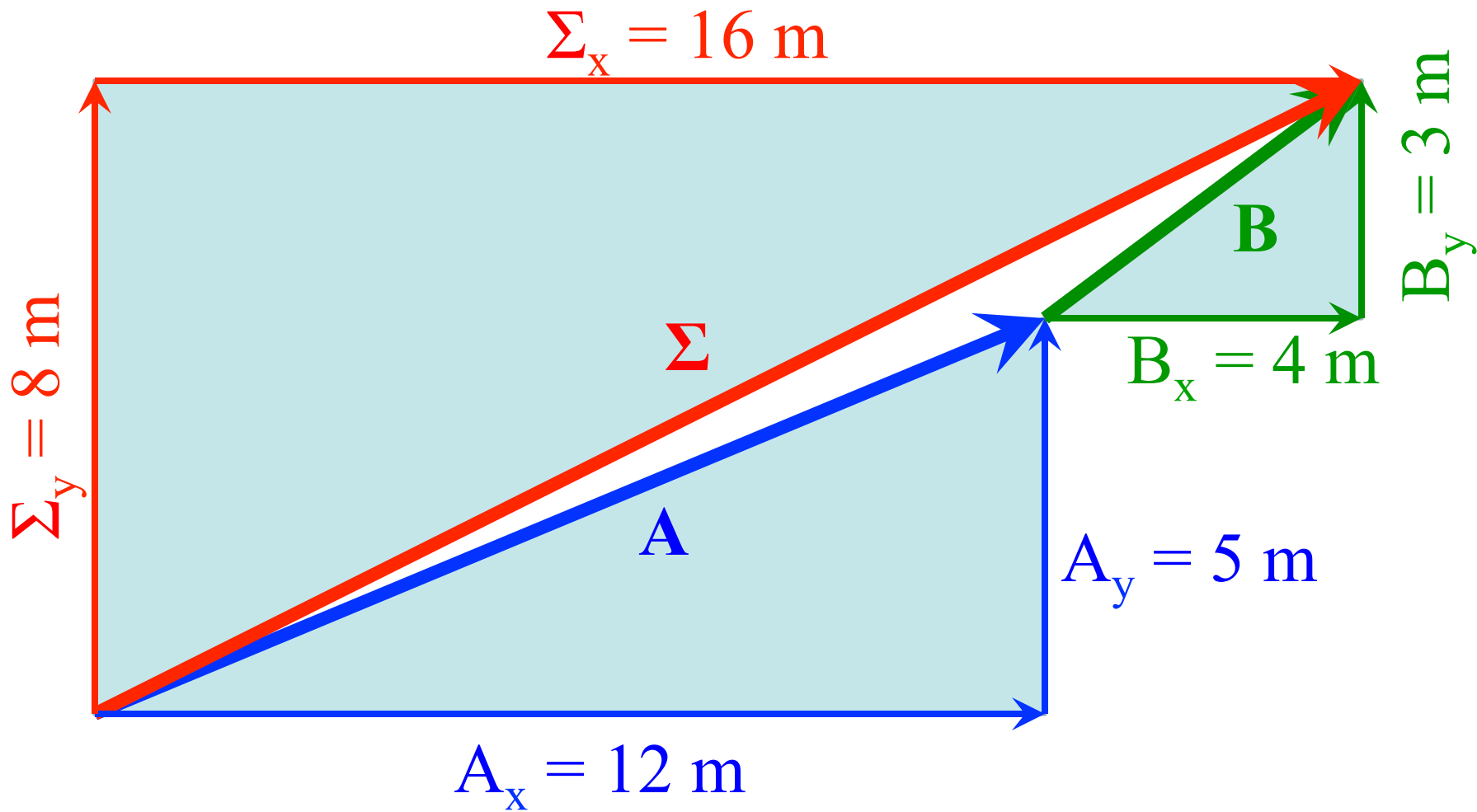
	The student will be able to:	HW:
1	Add or subtract vectors graphically and determine a vector's opposite. ✓	1, 2
2	Calculate the components of a vector given its magnitude and direction. ✓	3, 4
3	Calculate the magnitude and direction of a vector given its components. ✓	5 - 9
4	Use vector components as a means of analyzing/solving 2-D motion problems. ✓	10 - 13
5	Add or subtract vectors analytically (using trigonometric calculations).	14, 15
6	Use vector addition or subtraction as a means of solving relative velocity problems.	16 - 20
7	State the horizontal and vertical relations for projectile motion and use the same to solve projectile problems and apply vector properties to projectile motion.	21 - 38



$$\mathbf{A} = 13.0 \text{ m}, 22.6^\circ$$

$$\mathbf{B} = 5.00 \text{ m}, 36.9^\circ$$

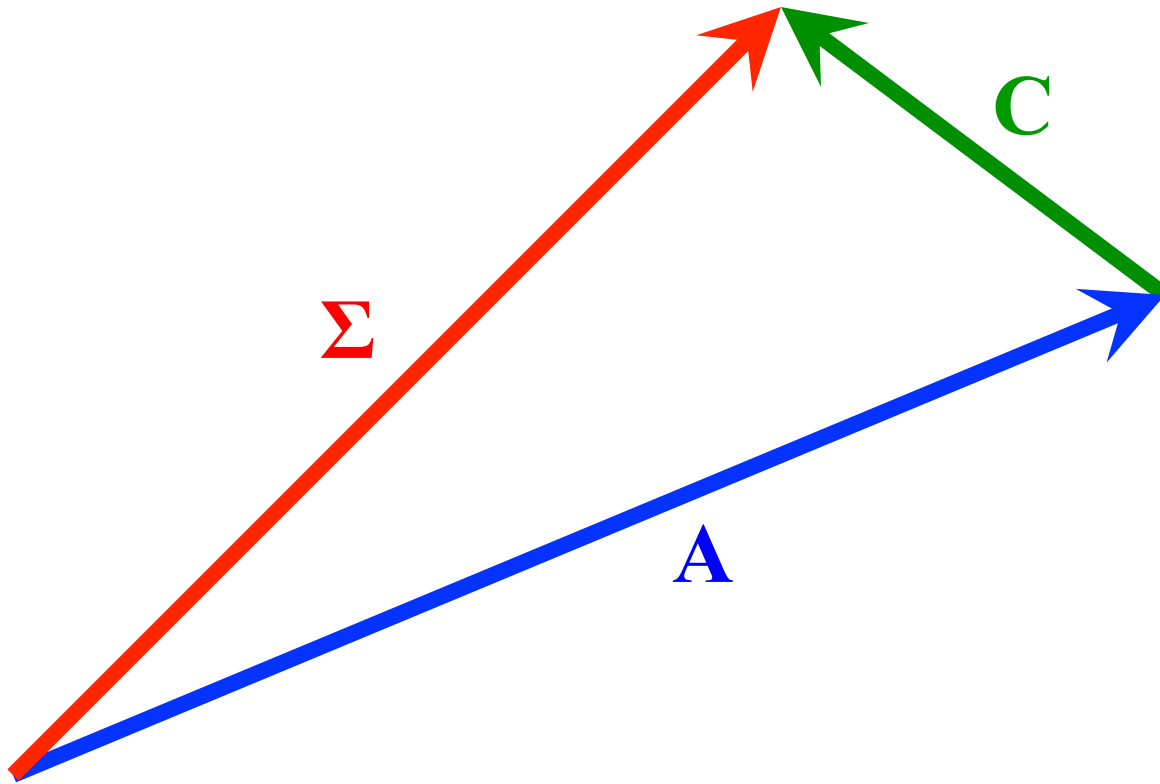
$$\Sigma = 17.9 \text{ m}, 26.6^\circ$$



$$\mathbf{A} = 13.0\text{ m}, 22.6^\circ$$

$$\mathbf{B} = 5.00\text{ m}, 36.9^\circ$$

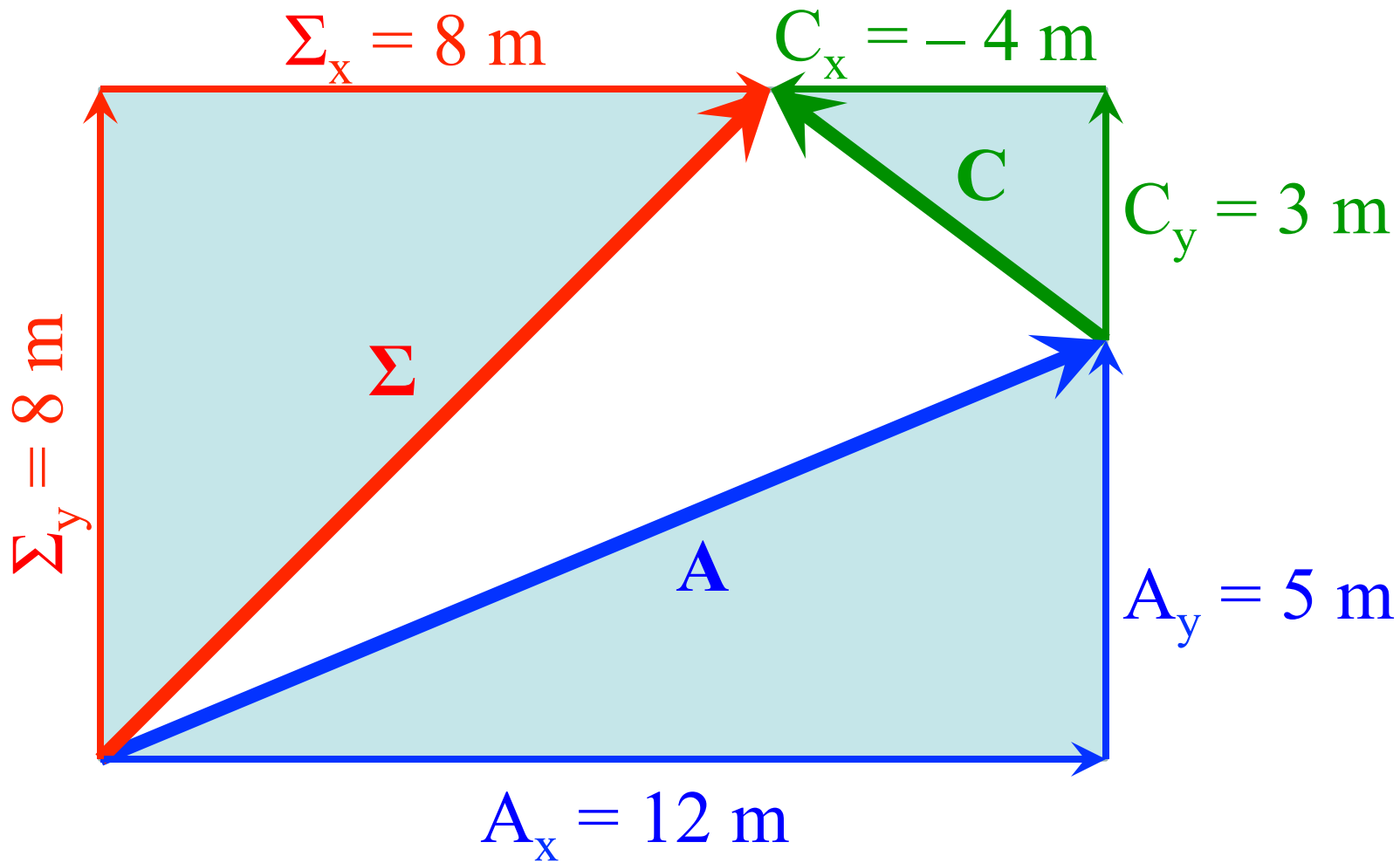
$$\mathbf{\Sigma} = 17.9\text{ m}, 26.6^\circ$$



$$\mathbf{A} = 13.0 \text{ m}, 22.6^\circ$$

$$\mathbf{C} = 5.00 \text{ m}, 143.1^\circ$$

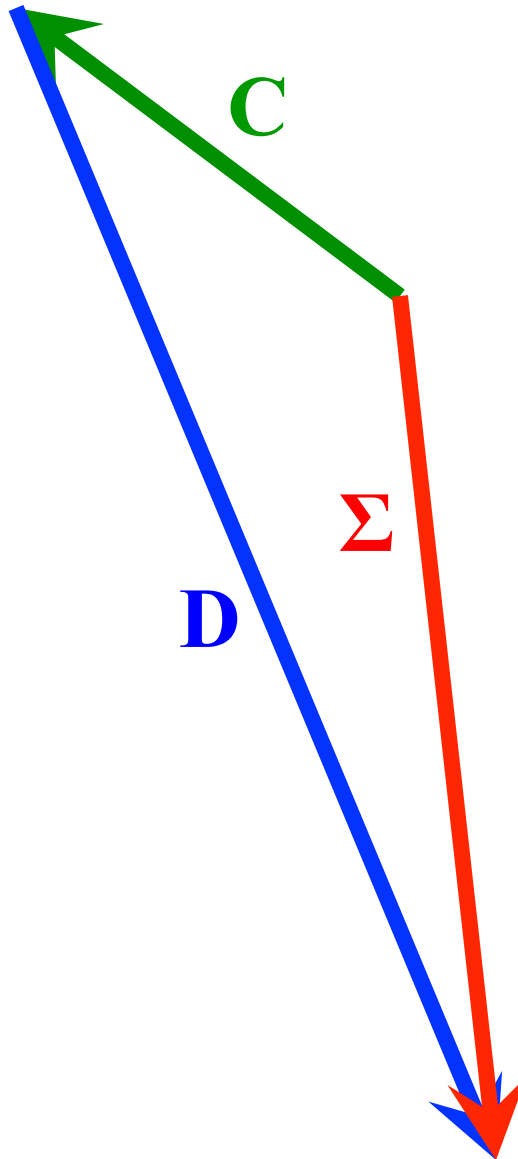
$$\mathbf{\Sigma} = 11.3 \text{ m}, 45.0^\circ$$



$$\mathbf{A} = 13.0\text{ m}, 22.6^\circ$$

$$\mathbf{C} = 5.00\text{ m}, 143.1^\circ$$

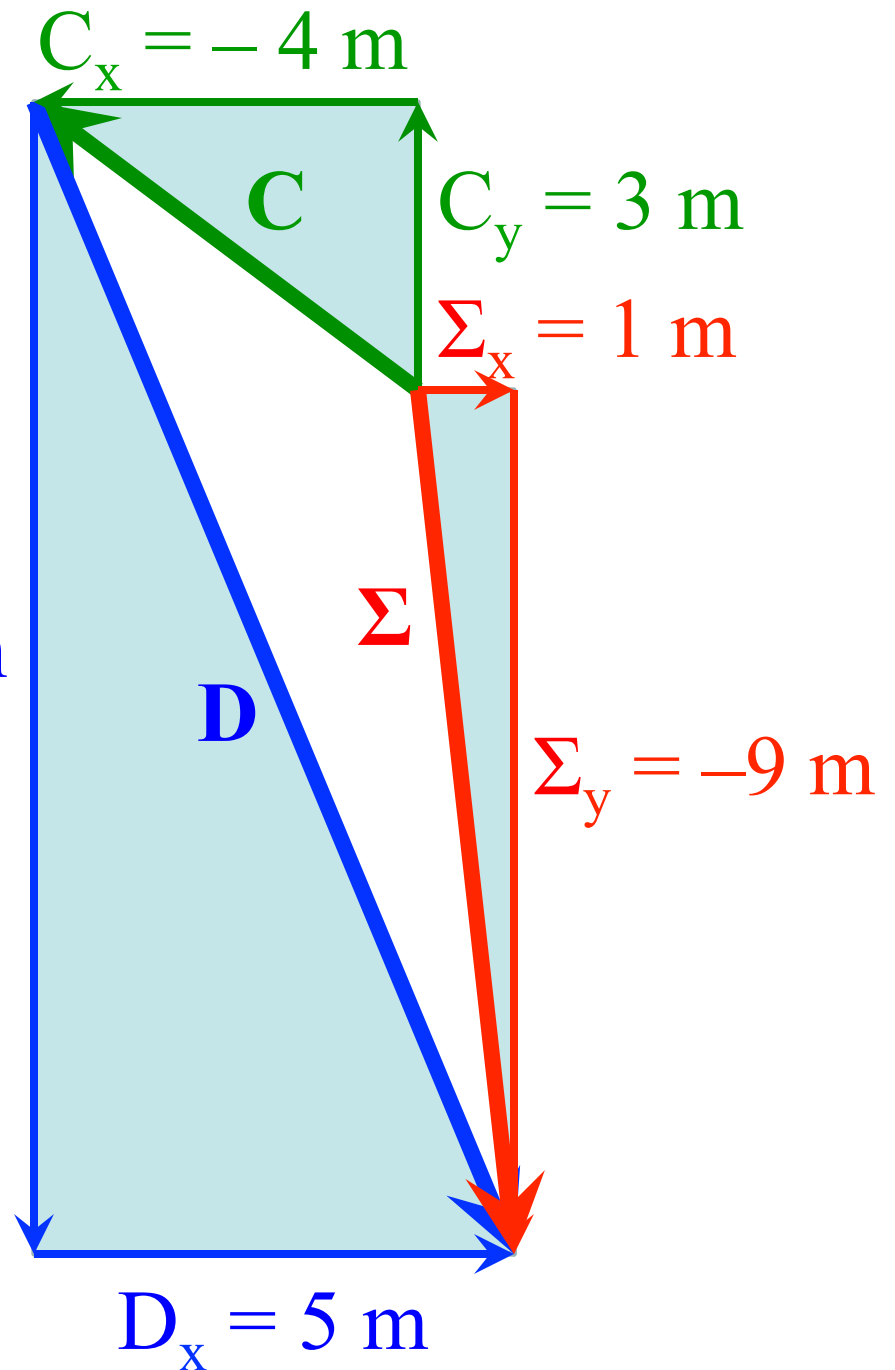
$$\mathbf{\Sigma} = 11.3\text{ m}, 45.0^\circ$$



$$\mathbf{C} = 5.00 \text{ m}, 143.1^\circ$$

$$\mathbf{D} = 13.0 \text{ m}, 292.6^\circ$$

$$\mathbf{\Sigma} = 9.06 \text{ m}, 276.3^\circ$$



$C = 5.00 \text{ m}, 143.1^\circ$
 $D = 13.0 \text{ m}, 292.6^\circ$

 $\Sigma = 9.06 \text{ m}, 276.3^\circ$

Using Components to Add Vectors

$$\vec{A} + \vec{B} = \vec{\Sigma}$$


$$A_x + B_x = \Sigma_x$$

$$A_y + B_y = \Sigma_y$$

- Determine the components of each vector.
- Add like components.
- Use Σ_x and Σ_y to find the magnitude and direction of the resultant.