

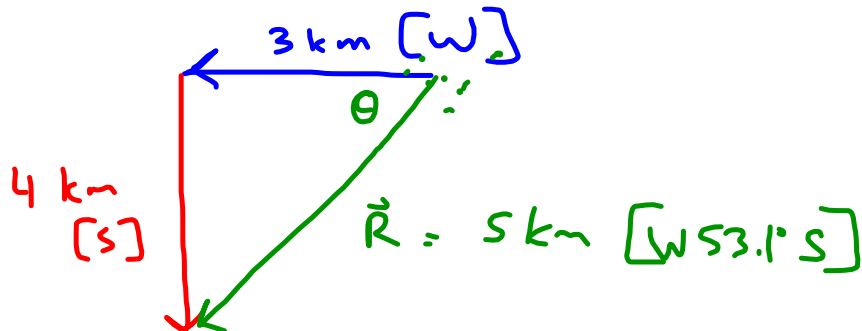
ADDING VECTORS II

Algebraic Method

Goals for this class:

- to find the vector sum of a horizontal and vertical vector algebraically
- to find the components of any vector

Given $\vec{A} = 3 \text{ km [W]}$ and $\vec{B} = 4 \text{ km [S]}$. Determine $\vec{A} + \vec{B}$.



Use pythagorean theorem to find magnitude of \vec{R} :

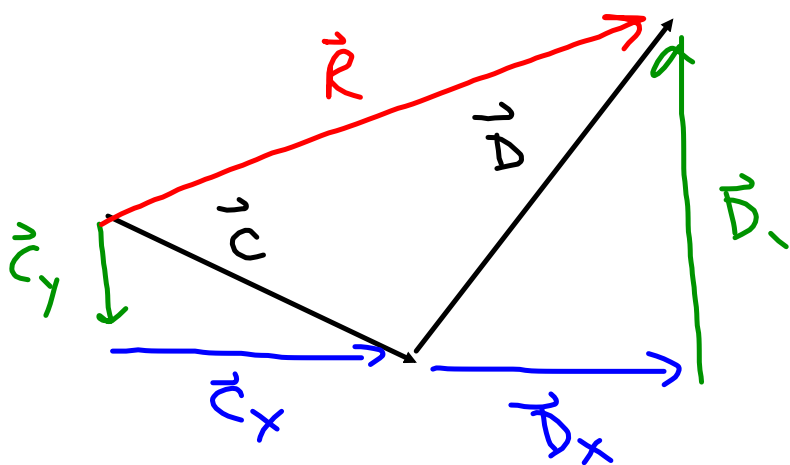
$$\|\vec{R}\| = \sqrt{3^2 + 4^2} = 5$$

and trig ratio for angle:

$$\tan \theta = \frac{4}{3}$$

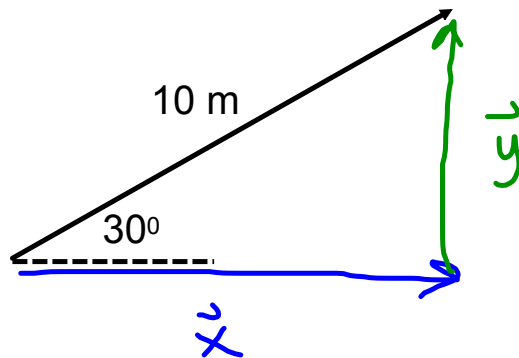
$$\theta = \tan^{-1}\left(\frac{4}{3}\right) = 53.1^\circ$$

To add vectors that are not horizontal and vertical, we first have to step back and look at **components**.



We use horizontal and vertical components.

Any vector can be represented as a sum of its horizontal and vertical components.



$$\cos 30^\circ = \frac{x}{10}$$

$$10 \cos 30^\circ = x$$

$$x = 8.67 \text{ m}$$

$$\sin 30^\circ = \frac{y}{10}$$

$$10 \sin 30^\circ = y$$

$$y = 5 \text{ m}$$

Components Handout

1

1. a)

