Lesson 2
Thursday, March 25, 2010
1:03 PM

Vectors + Scalars

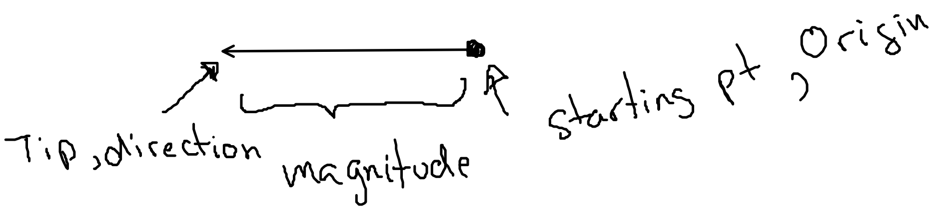
Vector is a measured quantity with direction

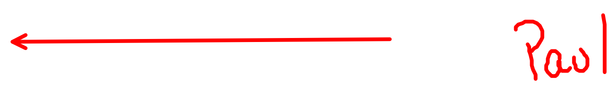
Scalar is a measured quantity only

ex of a vector is, Errol walked 45m South
" of a scalar " " 45m.

If we are talking about vectors, we can describe by using an arrow

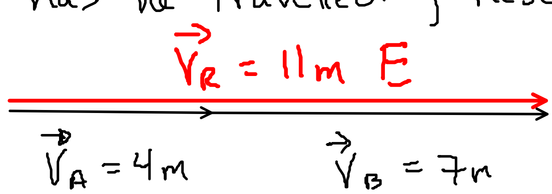
ex Josh travels 5m W





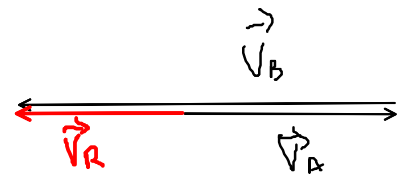
Adding + subtracting of Vectors

ex Josh travels 4m East, stops, travels 7m East
how far has he travelled, Resultant Vector?



ex Josh travels 4m East stops travels 7m West
find the resultant Vector

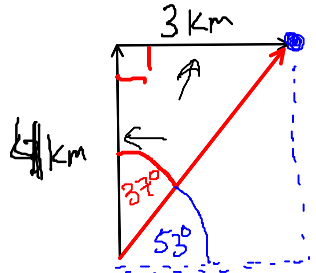
find the resultant vector



$\vec{V}_A + \vec{V}_B = \vec{V}_R$

$\vec{V}_R = 3m$

Paul drove 4km north, stopped, drove 3 Km East
Determine the resutant vector



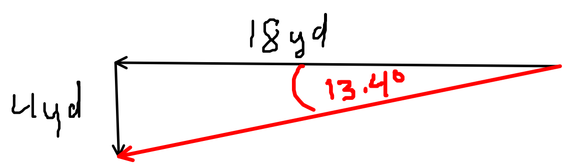
$\vec{V}_A + \vec{V}_B = \vec{V}_R$

$\vec{V}_R = 5km\ 37^0$ E of N

$\vec{V}_R = 5km\ 53°$ N of E

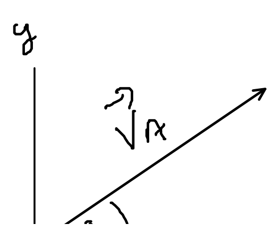
$\tan\theta = \frac{3}{4}$ $\theta = \tan^{-1}(3/4)$

ex 18 yds west, 4 yd south find $\vec{V}_R$



$\vec{V}_R = 18.4$ yd $12.5°$ S of W
$= 18.4$ yd $78°$ W of S

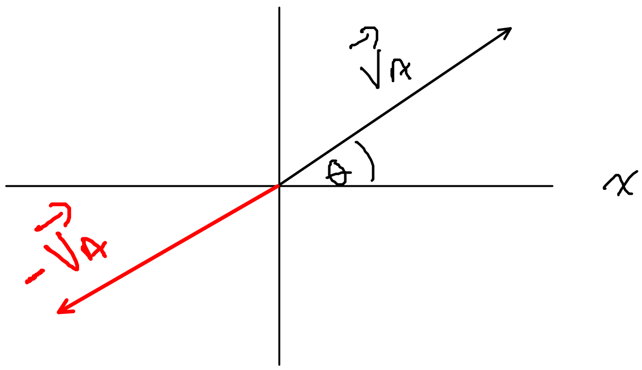
ex



find $-\vec{V}_A$

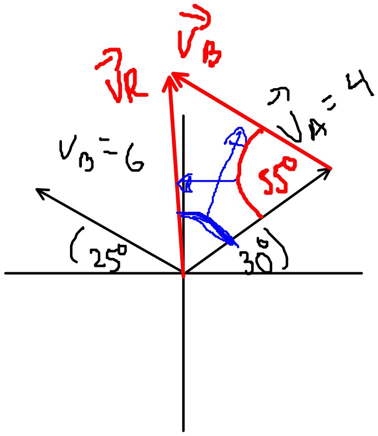
ex

find $-\vec{V}_A$



$$\vec{V}_A - \vec{V}_B = \vec{V}_R$$

$$\vec{V}_A + (-\vec{V}_B) = \vec{V}_R$$



$$\vec{V}_A + \vec{V}_B = \vec{V}_R$$

We move $\vec{V}_B$ to the tip of $\vec{V}_A$ and now calc $\vec{V}_R$ using Cos law

$$c^2 = 4^2 + 6^2 - 2(4)(6)\cos 55^\circ$$

$$c = 4.95$$

$$\frac{\sin A}{6} = \frac{\sin 55}{4.95} \cdot 6$$

$$A = \sin^{-1}\left(\frac{6 \cdot \sin 55}{4.95}\right)$$

$$\angle A = 83^\circ$$

$\vec{V}_R$ = 4.95 km ∠23° W of N
4.95 km 67° N of W

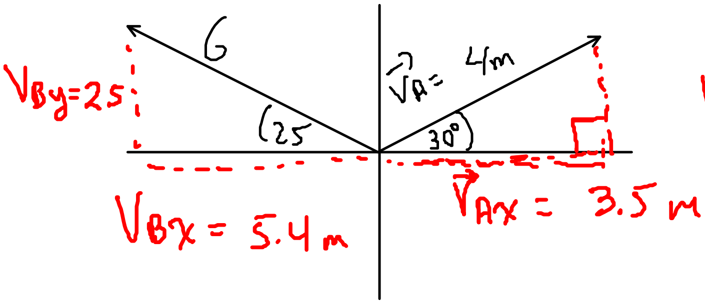
ex

$$\vec{V}_A - \vec{V}_B = \vec{V}_R$$

$$\vec{V}_A + (-\vec{V}_B)$$

$\vec{V}_R$ = 8.92 m @ 3.4° S of E

component method



$\vec{V}_{Ay} = 2m$ } using SOHCAHTOA

$\vec{V}_A + \vec{V}_B = \vec{V}_R$

$\vec{V}_{Ax} + \vec{V}_{Bx} = \vec{V}_{Rx}$

$\vec{V}_{Ay} + \vec{V}_{By} = \vec{V}_{Ry}$

$V_R = \sqrt{(V_{Rx})^2 + (V_{Ry})^2}$