Vectors

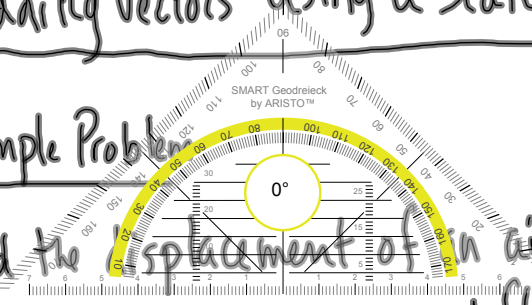
Scalar - size 10km

Vector - size (magnitude) + direction 10km [E]

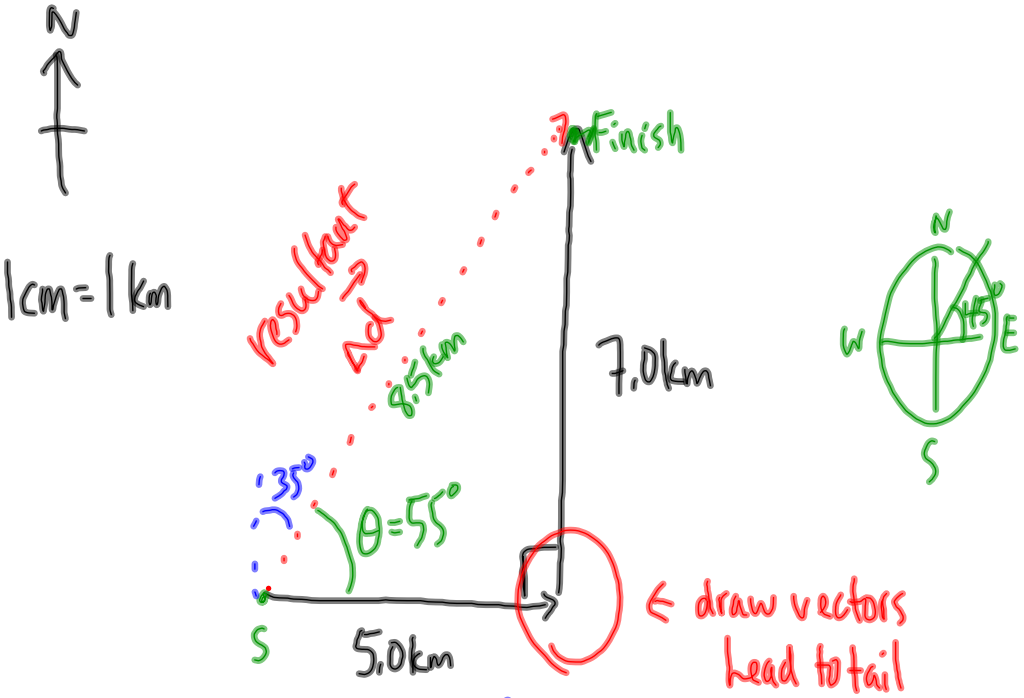
	Scalar	Vector	
Δd	distance	displacement	$\vec{\Delta d}$
v	speed	velocity	$\vec{v}$
a	acceleration	acceleration	$\vec{a}$
F	force	force	$\vec{F}$

Adding Vectors using a Scale Diagram

Sample Problem



Find the displacement of an airplane that flies 5.0km due East and then turns and flies 7.0km due North.



The displacement of the airplane is:

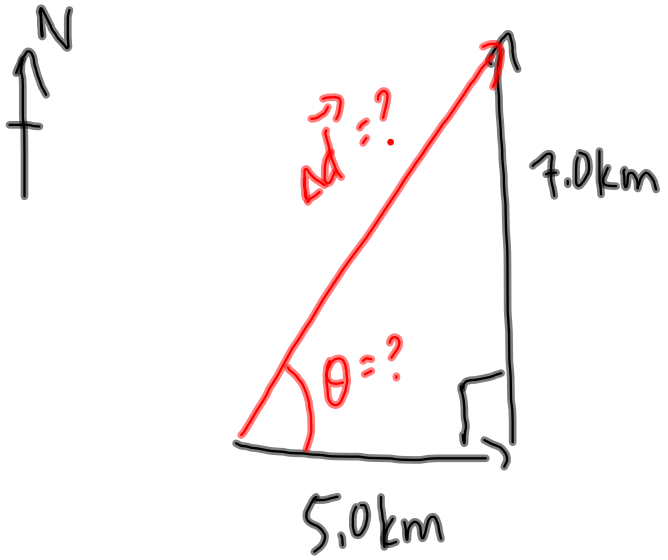
$\vec{\Delta d} = 8.5\text{km}\ [\text{E } 55^\circ \text{ N}]$

$[\text{N } 35^\circ \text{ E}]$

$[55^\circ \text{ N of E}]$

$[35^\circ \text{ E of N}]$

Mathematical Solution



$c^2 = a^2 + b^2$

$c^2 = (5.0km)^2 + (7.0km)^2$

$c = 8.6\,km$

$\tan\theta = \frac{opp}{adj}$

$\tan\theta = \frac{7.0km}{5.0km}$

$\theta = \tan^{-1}(7/5)$

$\theta = 54°$

$\Delta\vec{d} = 8.6km\,[E54°N]$