Vectors

Vectors are quantities that have magnitude (how big something is) and direction.

Ex: Displacement (3 m to the right), velocity (5 mph South), Force (100 N down).

Scalars:

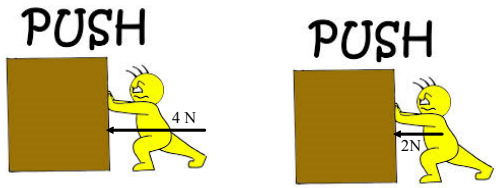
Scalars are quantities that have magnitude only. You cannot point in the direction of a scalar.

Ex: Age (17 years old), time (3:25 pm), temperature (82 degrees F), mass (100 kg).

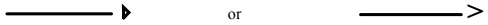
Representing Vectors

Vectors are represented by arrows. The length of the arrow indicates the magnitude. A vector indicating a 2 N force should be half as long as a vector indicating a 4 N force.

Magnitude



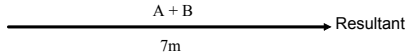
What not to do



Adding Vectors

To add vectors we place them tip to tail.

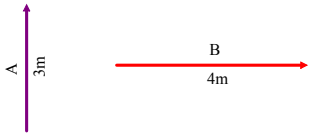
A + B



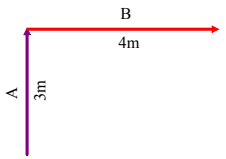
What would B + A look like?

Adding Vectors

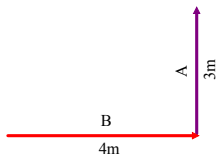
To add vectors we place them tip to tail.



A + B



B + A



Adding Vectors

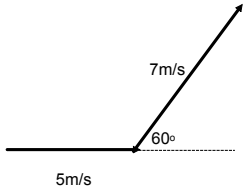
To add vectors we place them tip to tail.

A + B

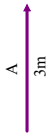
B + A

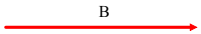
Drawing Scaled Diagrams

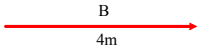
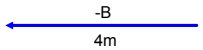
1) Find the resultant of 5m/s East and 7m/s at 60° North from the horizontal.
Use the scale 1 cm = 1 m/s



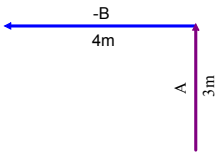
Subtracting Vectors





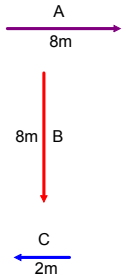
If this is B  , then -B looks like 

A - B = A + (-B)



Challenge Problem

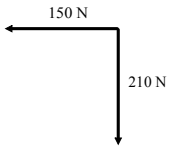
Given the following vectors show that A + B + C = C + B + A



What does A - C + B look like?

Find the resultant

1)



2)