Vectors and Scalars

September-23-15 7:32 AM

Scalar: Forms of measurement that only account for the size or magnitude of the measurement

Vector: a quanity that has both direction and magnitude

Scalar	Vector
Distance	Displacement
Speed	Velocity
Mass	Acceleration
Volume	Force
Energy	Momentum

Distance vs. Displacement

Distance: the total length between objects or the total length an object has travelled

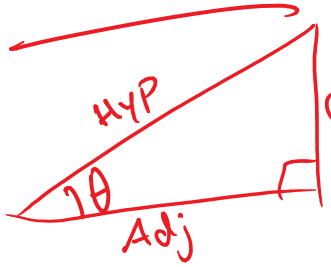
Displacement: the total length From the initial point to the final point.

Reminder

SOHCAHTOA

$\sin\theta = \frac{OPP}{}$

Reminder



SOH...

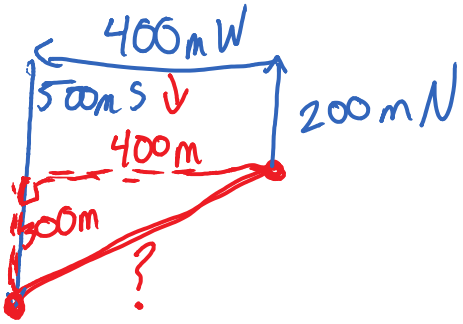
$\sin\theta = \frac{OPP}{HYP}$

$\cos\theta = \frac{Adj}{HYP}$

$\tan\theta = \frac{OPP}{Adj}$

p. 39

A woman walking her dog. 200m N, 400m W, 500m S



a) $200m + 400m + 500m = 1100m$

b) Size of displacement

$400^2 + 300^2 = \vec{d}^{\,2}$

$160000 + 90000 = \vec{d}^{\,2}$

$\sqrt{250,000} = \sqrt{\vec{d}^{\,2}}$

$\vec{d} = 500m$

Note: The symbol we use to show something is a vector is an arrow ontop of whatever variable we are using.

displacement $\Rightarrow \vec{d}$

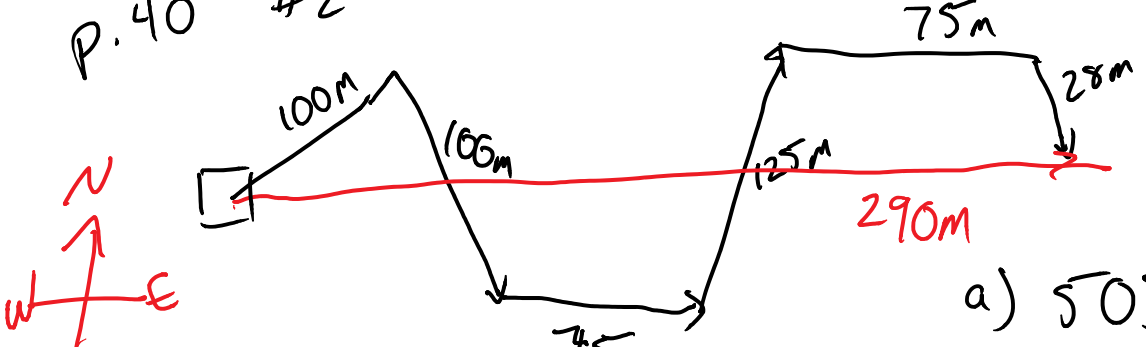
Velocity $\Rightarrow \vec{v}$

acceleration $\Rightarrow \vec{a}$

distance $\Rightarrow d$ (no arrow)

Speed $\Rightarrow s$

p. 40 #2



add it up

a) 503 m

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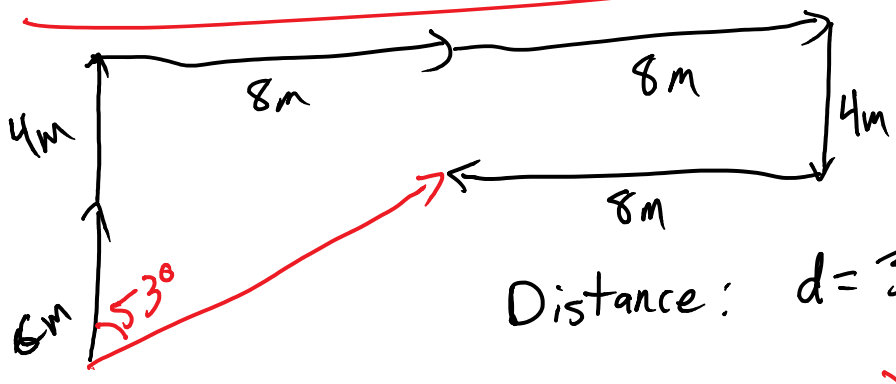
b) 290 m East



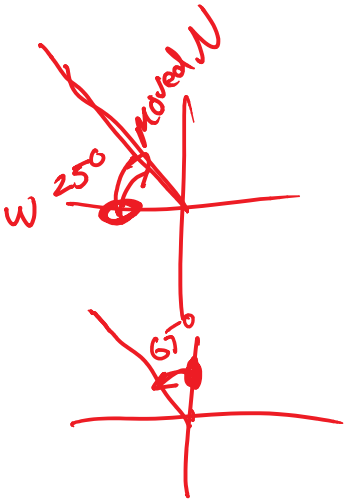
Distance: $d = 38\ m$

Displacement: $\vec{d} = 10\ m$ NE

53° E of N

Directions

Compass



25° N of W

Direction it moved

axis

65° W of N

Directions p.2.

When moving in a line (only left/right, or up/down)

we can just say one direction is positive and the other is negative.

Ex. An elevator goes up 3 floors, down 2 floors, up 4 floors

What is its displacement? up +

$\vec{d} = +3 -2 +4 = 5$ floors

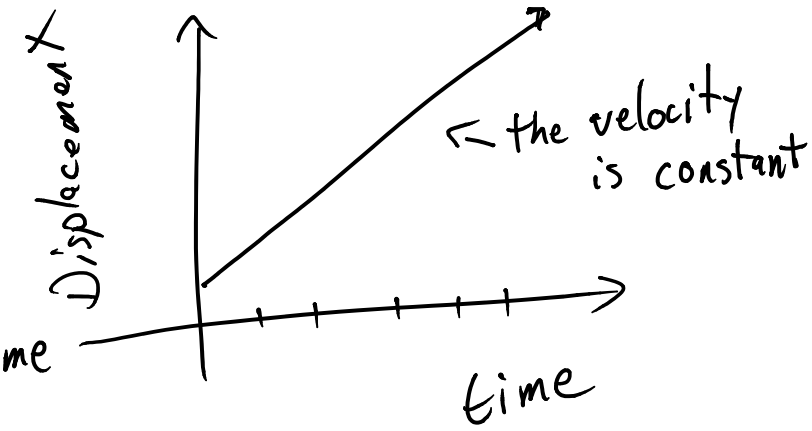
Velocity vs. Speed

Velocity is change in displacement over time

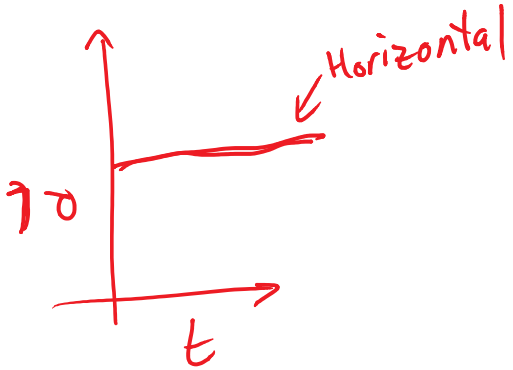
Speed " " " distance " "

Formula: $\vec{v} = \frac{\vec{d}}{t}$

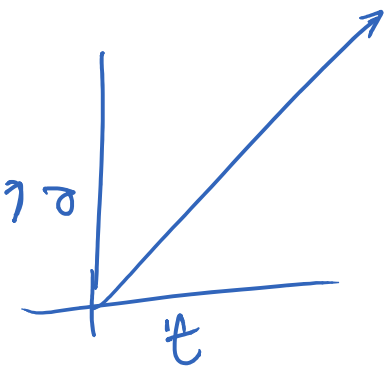
Graphs: Displacement vs time graph



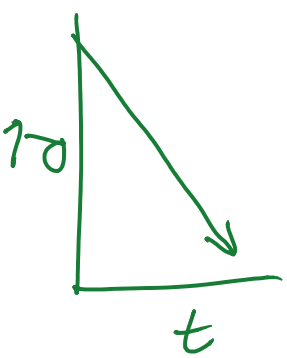
* Velocity is always the slope of a distance vs time graph p. 44



$\vec{v} = 0$



$\vec{v}$ = positive



$\vec{v}$ = negative

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