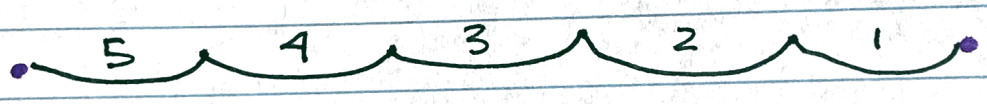
Units & Conversions

01/22/18

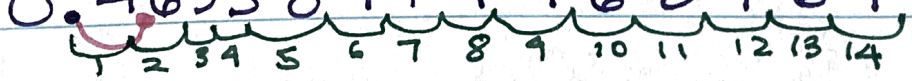
Distance - meters (m)
Time - seconds (s)
Speed/Velocity - meters per second $(\frac{m}{s})(\frac{m}{s})$
Mass - kilograms (kg)
Volume - milliliters (mL)(cm^3)

K	H	D	B	D	C	M
Kilo	Hecta	Deka	BASE	Deci	centi	milli
1000	100	10	1	1/10 (0.1)	1/100 (0.01)	1/1000 (0.001)

Ex1 

$= 0.00040$

Scientific Notation

Ex. 

4.65×10^{-14}

UNIT 1: MOTION

Physics: (from Greek Physika) = "Nature of or Natural things"

The search for laws that govern the universe.
The laws place limits on what is allowed in the universe.

* Unlike other sciences, physics is cumulative. Must start from the beginning.

= Linear Motion

- Motion is Relative (depends on perspective) frame of reference
  - you & the sun
  - you on a train
  - you in a car

- Motion can be expressed through numbers.
  = Kinematics

$$v = \frac{d}{t} \qquad a = \frac{v_f - v_i}{t} \qquad v_f = v_i + at$$

$$v_f^2 = v_i^2 + 2ad$$

$$d_{(\Delta x)} = v_i + \tfrac{1}{2}at^2 \qquad d_{(\Delta x)} = \tfrac{1}{2}(v_f - v_i)t$$

Motion can be described verbally.

1-D vs 2-D
Linear: one direction

x = horizontal component
y = vertical component (up & down)

Scalar	vs	Vector
Speed		Velocity (speed w/ direction)
#s only Magnitude		#s + direction magnitude & direction

Constant	vs	Accelerating
move @ same speed/velocity		speed up or slow down

Average	vs	Instantaneous
total distance / total time		in that moment how fast moving

Distance	vs	Displacement
total travelled		Start point to end point

NOTES

01/13/2017

Linear Motion

Motion in 1-Dimension
Kinematics

Motion: object moving
Motion dependent on frame of reference.
Motion is RELATIVE!

Distance vs. Displacement
how far travel — change in position start to finish measured in a straight line.
$\Delta x = x_f - x_i$

Speed	vs	Velocity
↓ how fast		↓ how fast & what Direction
Scalar Quantity magnitude only		Vector Quantity magnitude & direction

Kinematic Equations

$v = \frac{d}{t}$ measured in m/s

$a = \frac{v_f - v_i}{t}$ measured in m/s^2

Δx or $d = \frac{1}{2}(v_f - v_i)t$ Δx or $d = v_i t + \frac{1}{2}at^2$

$v_f^2 = v_i^2 + 2ad$ $v_f = v_i + at$

Unit 1 Motion

08/10/17

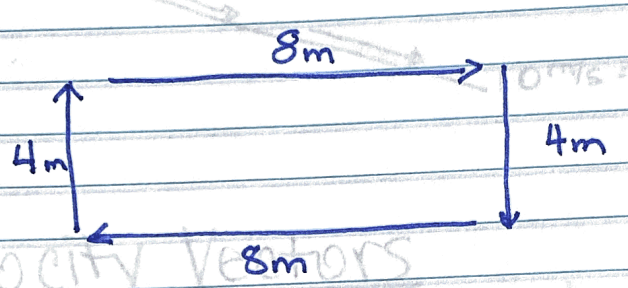
1-D Kinematics (Linear)

Distance (d) vs Displacement (d)

how much ground is covered

change in position

* measured in meters (m)
* time measured in seconds (s)



distance: 24m
displacement: 0m

Vector - Quantities expressed by #s & position.

Scalar - Quantities expressed only by #s.

speed (scalar) = # Magnitude

velocity (vector) = # & position magnitude & direction

$v = \frac{d}{t}$ (m/s) $v = \frac{\text{distance}}{\text{time}}$

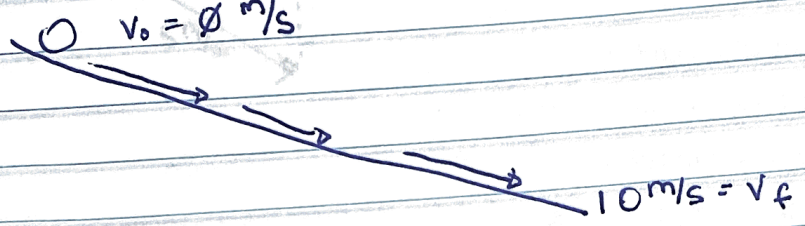
08/11/2017

Instantaneous Velocity V, V_0, V_f
velocity @ a given instant

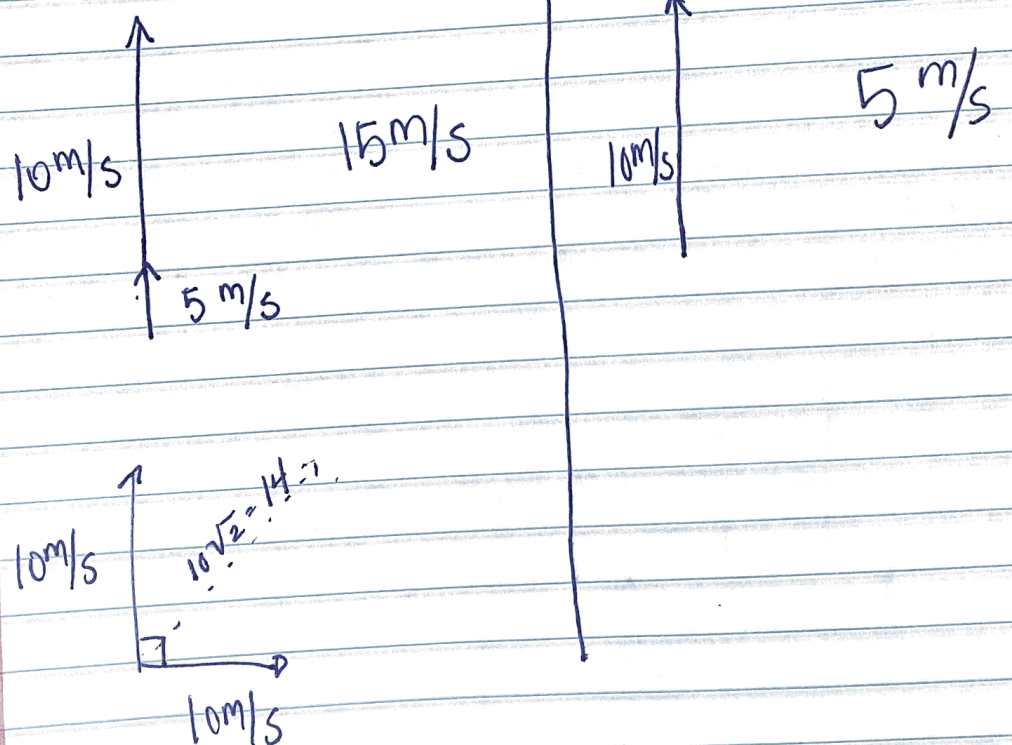
Average Velocity $\bar{V}$
$\frac{\text{total distance}}{\text{total time}}$

$$\bar{V} = \frac{V_0 + V_f}{2} = \frac{0 + 10}{2} = 5 \text{ m/s}$$

$\bar{V} = 5 \text{ m/s}$



Velocity Vectors



08/11/17

Parallelogram Method.