Science 10

Monday, May 1/17

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1. Check:
   First 5 Problems: Worksheet - Speed, Distance and Time
   Finish Sheet for HW

2. Types of Physical Quantities

3. Position

4. Displacement

5. Velocity - Period 4 - To Be Continued

6. Calculating Velocity

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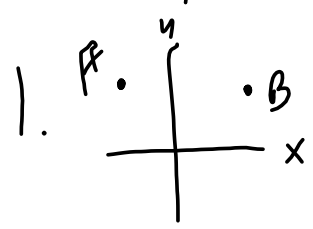
7. Representing Vector Quantities

8. Resultant (Final) Displacement

9. Average Velocity

Next Assigment: Science 10

→ Tuesday - May 2/17

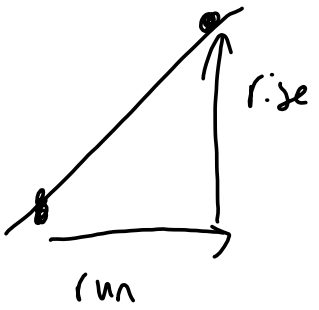
1. 

a) plot a given ordered pair

A = (-4, 5)

b) give the ordered pair for a point

(?, ?)



c) State slope

$m = \frac{rise}{run}$

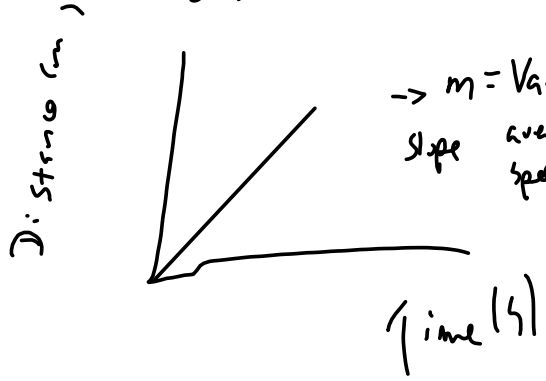
25

2. Given

Time (s)	Distance (m)
⋮	⋮

→ Draw a Distance vs. Time graph

Distance vs. Time:



→ m = Vav

slope = average speed

Worksheet - Speed, Time, Distance

1. 20 m/s
2. 5.0 m/s
3. 2.0 m/s
4. 43.89 m/s
5. 64 $\frac{km}{h}$
6. 5 s
7. 1.3×10^{2} s
8. 10.7 s
9. 5×10^{1} m
10. 1×10^{1} m
11. 8.8×10^{2} m

Challenge

2.0 $\frac{m}{s}$ faster

Types of Physical Quantities

Physical Quantities

Scalar Quantities

size/magnitude (with units) (#)

time	t	12 s
distance	d	25 km
speed	v	10 m/s

Vector Quantities

http://safeshare.tv/w/FKmoBgWxTy

size/magnitude (with units) (#) and direction

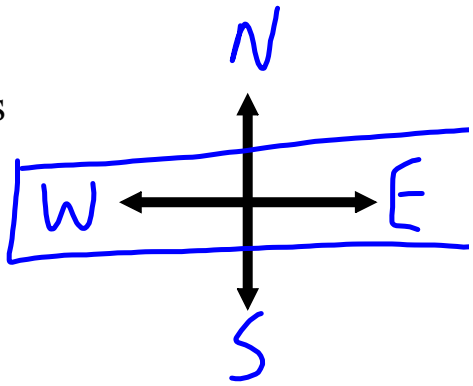
?

Direction

Direction is generally stated relative to a reference point (starting point).

By convention (traditionally):

Positive Directions (+)	Negative Directions (−)
right	left
up	down
north	south
east	west



Position

position - vector quantity
- separation and direction from a reference point

symbol: $\vec{d}$ or **d**
unit: m, cm, km

Displacement

displacement - vector quantity
- change in position

symbol: Δd or $\Delta \mathbf{d}$
unit: m, cm, km

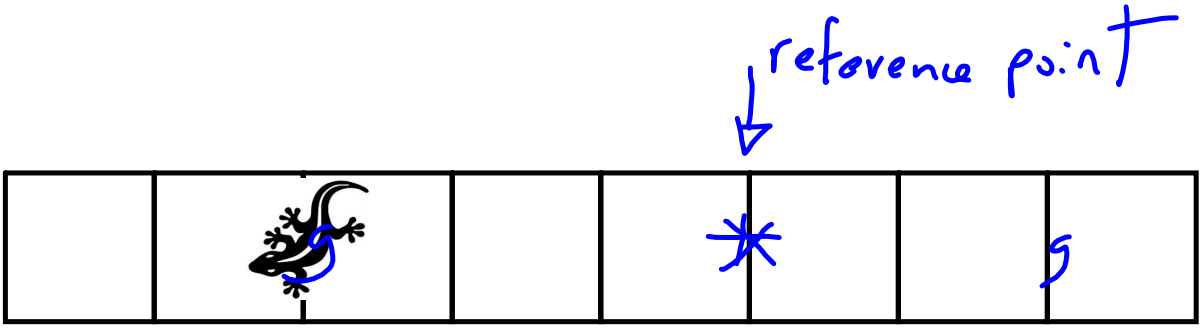
$$\Delta\vec{d} = \vec{d}_f - \vec{d}_i$$

$\Delta\vec{d}$ -> displacement

$\vec{d}_i$ -> initial position (starting position)

$\vec{d}_f$ -> final position

Gecko Demo



$\vec{d}_i = -3$

$\vec{d}_f = +2$

$\Delta\vec{d} = \vec{d}_f - \vec{d}_i$

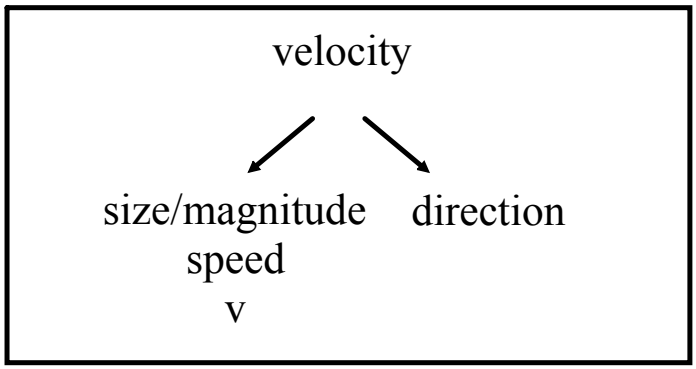
$\Delta\vec{d} = (+2) - (-3)$

$\Delta\vec{d} = +5$

Velocity

(Page 432)

Velocity is a vector quantity.



symbol: $\vec{v}$ or **v**

unit: m/s, km/h

An object with constant speed and direction has constant velocity. This type of motion is called uniform motion.

Physics 112

Monday, May 1/17

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1. Return -> SA - U2S2

2. Lab - The Explosion -> Was Due: April 27/17

3. Check ->
   Worksheet: Impulse-Momentum Theorem
   Worksheet: Extra Momentum, Impulse and Impulse-Momentum Theorem Problems
   Worksheet - Multiple Choice

4. SA U2S3 - Momentum, Impulse, Impulse-Momentum Theorem
   - Wednesday, May 3/17 → MC Prob.

5. Unit 3 - Work, Power and Energy

6. Concept Sheet

7. Work

8. Worksheet - C6 - Work Page 221: PP #1-3 - To Be Continued

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9. 3 Cases - No Work is Done

10. Worksheet - C6 - Work and No Work Done
    Page 225: PP #4-10

11. Types of Work - Positive and Negative

Worksheet: Extra.....

#6. $m = 10.0\,kg$
$\vec{v}_i = +4.5\,m/s$
$\vec{v}_f = -1.0\,m/s$

a) $\Delta\vec{v} = \vec{v}_f - \vec{v}_i$
$\Delta\vec{v} = -1.0 - 4.9$
$\Delta\vec{v} = -5.9\,m/s$

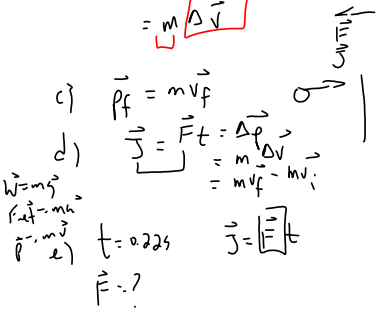
b) $\Delta\vec{p} = \vec{p}_f - \vec{p}_i$
$= m\vec{v}_f - m\vec{v}_i$
$= m(\vec{v}_f - \vec{v}_i)$
$= m\Delta\vec{v}$

c) $\vec{p}_f = m\vec{v}_f$

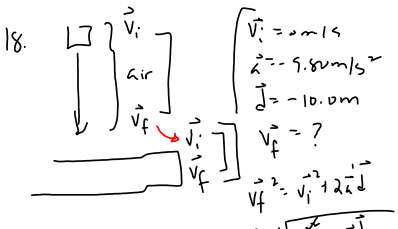
d) $\vec{J} = \vec{F}t = \Delta\vec{p}$
$= m\Delta\vec{v}$
$= m\vec{v}_f - m\vec{v}_i$

$\vec{W} = m\vec{g}$
$\vec{F}_{net} = m\vec{a}$
$\vec{p} = m\vec{v}$

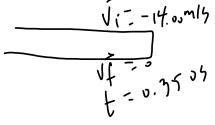
e) $t = 0.22\,s$ $\vec{J} = \vec{F}t$
$\vec{F} = ?$



18.



$\vec{v}_i = 0\,m/s$
$\vec{a} = -9.80\,m/s^2$
$\vec{d} = -10.0\,m$
$\vec{v}_f = ?$
$\vec{v}_f^{\,2} = \vec{v}_i^{\,2} + 2\vec{a}\vec{d}$
$\vec{v}_f = \sqrt{\vec{v}_i^{\,2} + 2\vec{a}\vec{d}}$
$\vec{v}_f = \sqrt{2(-9.80)(-10.0)}$
$\vec{v}_f = \ominus 14.00\,m/s$



$\vec{v}_i = -14.0\,m/s$
$\vec{v}_f = ?$
$t = 0.35\,s$

$\vec{F}t = m\vec{v}_f - m\vec{v}_i$
$\vec{F} = \frac{-(1.50)(-14.00)}{0.35}$
$\vec{F} = +60\,N$

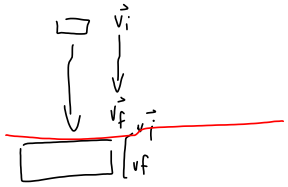
#22. $\vec{F} = 8.2\times10^{2}\,N$
$m = 82.3\,kg$
$\Delta\vec{v} = 10\,m/s$

$\vec{J} = \vec{F}t$
$\vec{J} = \Delta\vec{p}$
$\vec{J} = m\Delta\vec{v}$
$\vec{J} = (82.3)(10)$
$\vec{J} = 8.0\times10^{2}\,kg\frac{m}{s}$

#23. $m = 0.80\,kg$
$\vec{J} = 25\,N\cdot s$
$\Delta\vec{p} = ?$

$\vec{J} = m\Delta\vec{v}$
$\vec{J} = \Delta\vec{p}$
$\Delta\vec{p} = 25\,N\cdot s$

PP 35 Impulse Momentum



MC.

1. D	6. B	11. C	16. C
2. C	7. C	12. D	17. C
3. B	8. A	13. D	18. C
4. A	9. D	14. C	19. D
5. B	10. C	15. B	20. C

Physics 122

Monday, May 1/17

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1. FA - 2 Problems

2. FA - Multiple Choice

3. SA - Circular Motion and Heavenly Bodies
   - MC and Problems
   - Wednesday, May 3/17

4. Simple Harmonic Motion

Formative Assessment: Circular Motion

Monday, May 1/17

A body travelling in a clockwise direction, moves uniformly with a speed of 3.5 m/s on a flat circular track of diameter 10 m.

a) What is the frequency of the body? (0.11 Hz)
b) What is the coefficient of static friction between the body and the track? (0.25)
c) If the centripetal force acting on the body is 12 N, what is the mass of the body? (4.9 kg)

Formative Assessment - Planetary Motion
Monday, May 1/17

The asteroid "197 Ike" has its own small moon, Nacdyl.

a) Find the mass of "197 Ike" given that the orbital radius of Nacdyl is 65 km and its period is 12 h. (8.7×10^{16} kg)

b) How far would a UFO be from the center of "197 Ike" if the UFO has an orbital speed of 648 km/h? (1.8×10^{2} m)