April 29 - Professional Learning Day (Friday)

May 5 - NBTA Meetings (Thursday)

May 6 - NBTA Council Day (Friday)

May 23 - Victoria Day (Monday)

May 27 - Professional Learning Day (Friday)

Physics 112

Wednesday, April 27/16

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*Library Books

Explain That Stuff - April 28/16

1. A: U2-S2 (Newton's Laws of Motion) - Thursday, April 28/16

2. Check -> Textbook: Page 485, #19-21 (C10)
   Worksheet: Force Problems Plus Atwood's Problems

3. Investigation: Atwood's Machine

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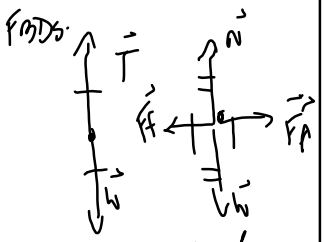
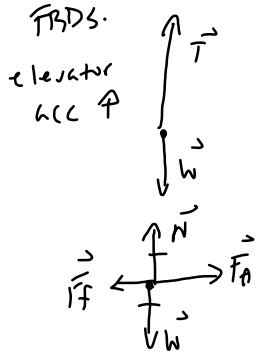
4. Newton's Third Law of Motion

1st Law	2nd Law
Law of Inertia ↓ definition (mass)	Law of Force, Acc + Mass
→ at rest → constant velocity	→ accelerates (speed up/slow down)
$\vec{F}_{net} = 0N$ $\vec{a} = 0 m/s^2$	$\vec{F}_{net} \neq 0N$ $\vec{a} \neq 0 m/s^2$
→ book on a table at rest → book pushed across a table at const. vel. → textbook held against a wall → textbook moved along a wall at const. vel → turkey suspended by a rope	→ acceleration → $\vec{v}_i \rightarrow \vec{v}_f$
FBDs:  → pairs of forces ie/ $F_A = F_f$ $w = mg$ $F_f = \mu N$ – WS. magnitude of $\vec{F}_A = 10N$ find $\vec{F}_A = 10N, E$	FBDs. elevator acc ↑  → $\vec{F}_{net} = m\vec{a}$ → $\vec{F}_{net} = m\vec{a}$ + kinematic eq. ⇒ $\vec{F}_{net} = m\vec{a}$ + individual forces WS

Science 122

Wednesday, April 27/16

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Midterm - April 28/16 (Thursday)

1. Worksheet: Archimedes' Principle

2. Experiment 13.1 - Archimede's Principle
(If Time Allows Next Week)

3. Hydrodynamics

Science 122 - Midterm Topics

1. Complex Circuit. * R's given

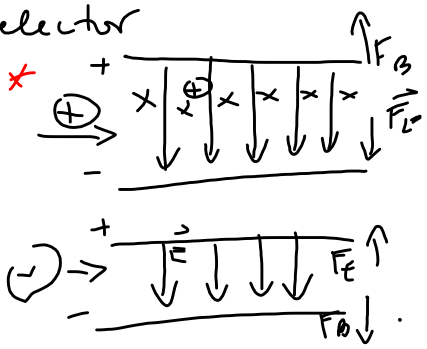
2. Magnetism
   - → Find B (3 cases)
   - → $F = ILB\sin\theta$
   - * → $F = qvB\sin\theta$
   - → * $r = \frac{mv}{qB}$ ← speed

→ velocity selector

$v = \frac{E}{B}$ *

$F_E = E$

$F_B = B$

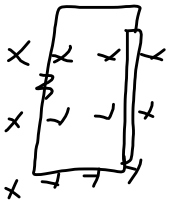


→ $\frac{q}{m} = \frac{2V}{r^2B^2}$ *

→ $V = EMF = BLv$ *

$V = IR$

$F = ILB\sin\theta$



→ Transformers → not on midt.

→ Optics
- → double lens. [Concave II divery *
- → mirror (spherical). *
  - concave) converging

→ Fluid Mechanics

hydrostatics → pressure ① *

→ hydrostatic eq^n. *

$P_2 = P_1 + \rho g h$

Science 10

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Wednesday, April 27/16

1. Comparing Velocity and Acceleration Directions
2. Sample Problems - Acceleration
3. Worksheets - Acceleration Problems - HW - Try 1st Sheet
4. Demo - Ball Toss
5. Freely Falling Bodies

Science 10

Worksheet: Position vs Time Graphs

y x

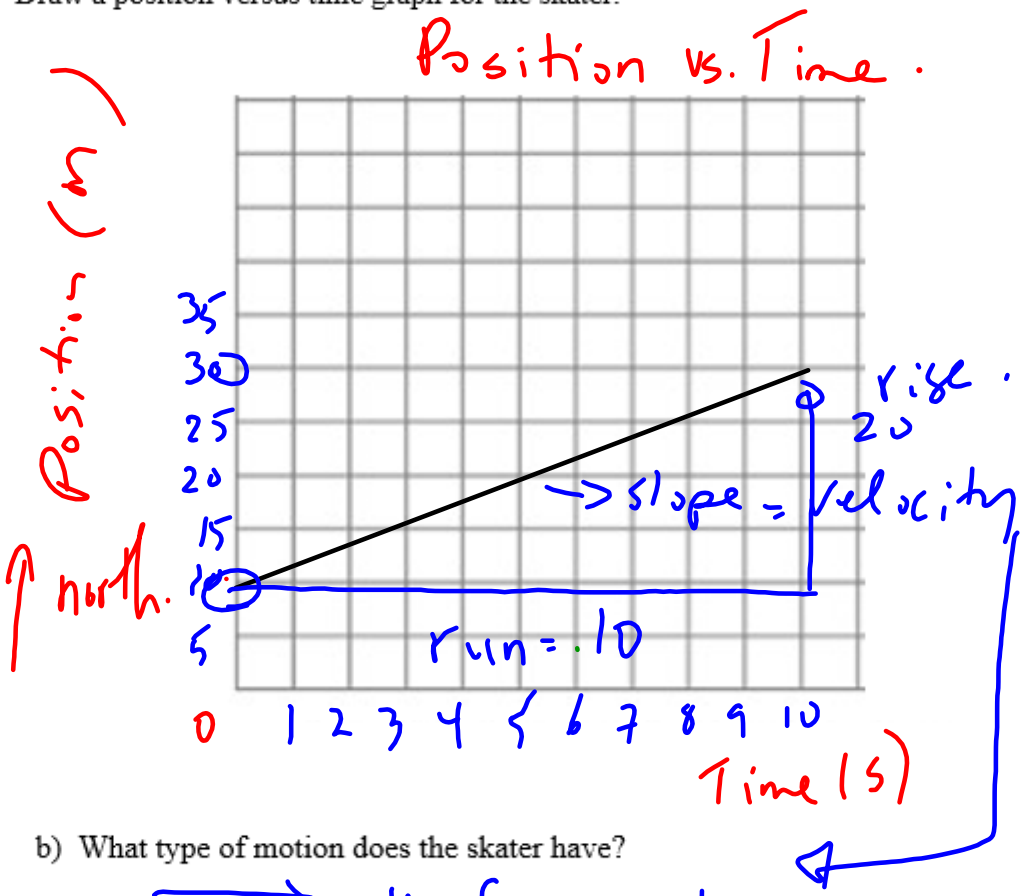
1. Robin, roller skating in a straight line north, was observed to be at the following positions at the following times:

x y

Time (s)	Position (m)
0.0	10
5.0	20
10.0	30

(0.0, 10)
(5.0, 20)
(10.0, 30)

a) Draw a position versus time graph for the skater.



b) What type of motion does the skater have?

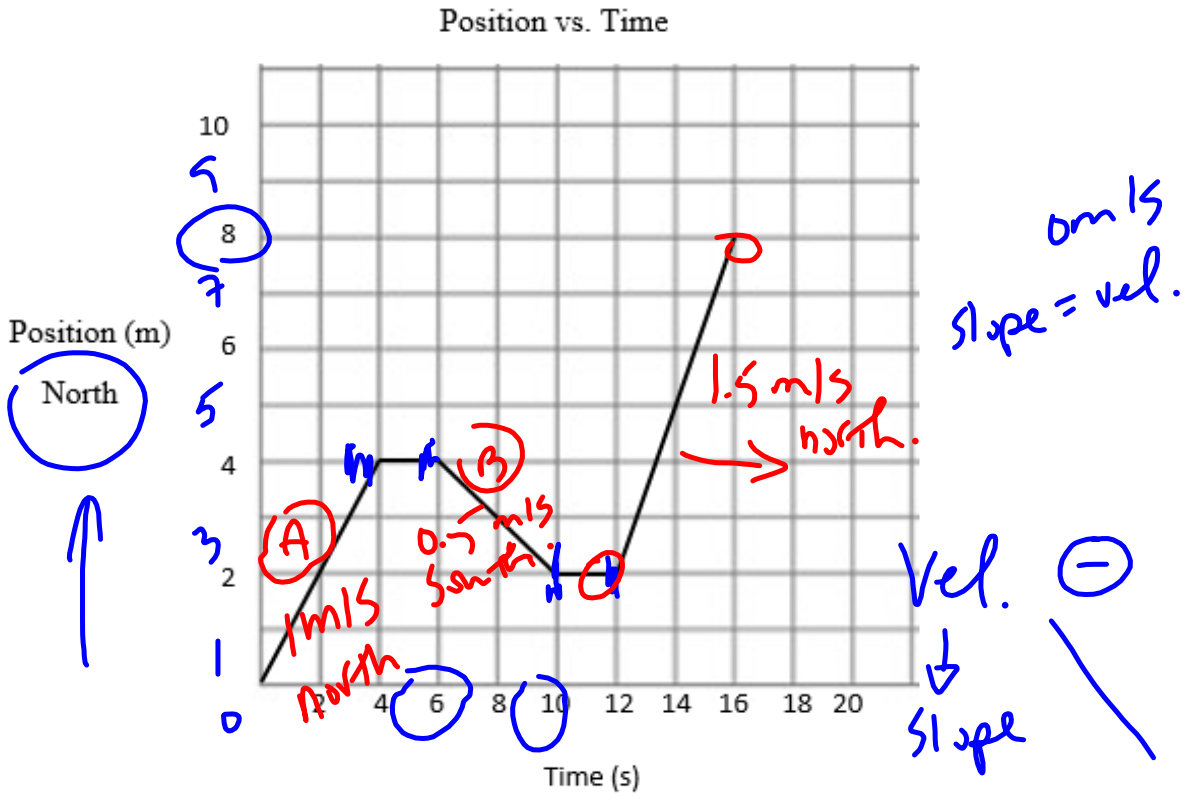
→ Uniform motion

c) Calculate the velocity of the skater. Show your work.

$$\text{Slope} = \text{velocity} = \frac{\text{rise}}{\text{run}} = \frac{+20}{+10} = 2.0\ \frac{m}{s}$$

$$\text{velocity} = \frac{y_2 - y_1}{x_2 - x_1} = 2.0\ \frac{m}{s}$$

2. A position-time graph for a second skater is shown below.



a) How many times did the skater stop?

2

b) During what time interval did the skater move in a negative direction?

between $t = 6$ s and $t = 10$ s.

c) What type of motion did the skater have between t = 12 s and t = 16 s?

Uniform motion

d) What was the maximum displacement of the skater?

6 m, north.

slope

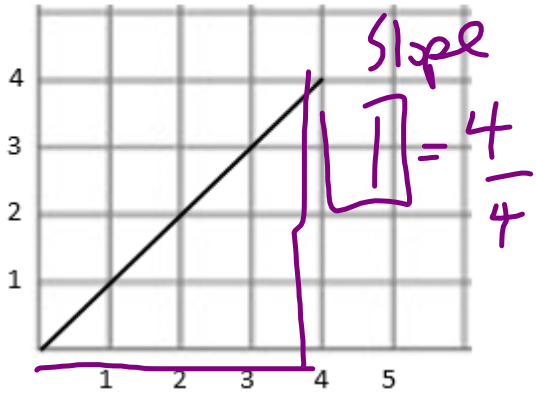
e) What was the maximum velocity of the skater?

slope

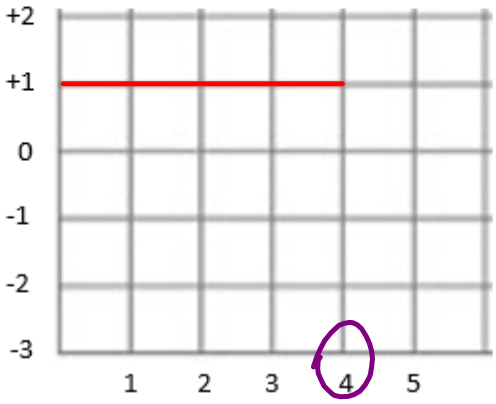
1.5 m/s, north.

3. Draw the velocity vs time graphs for an object whose motion produced the position-time graphs shown below at the left.

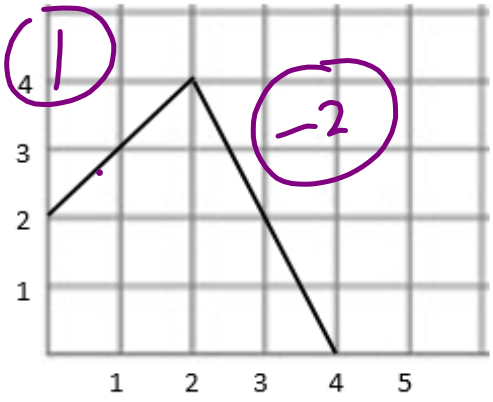
Position vs Time



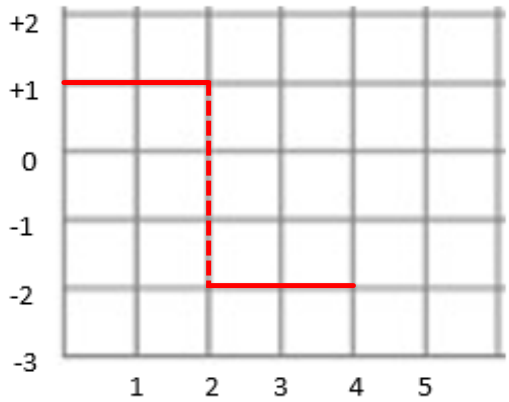
Velocity vs Time



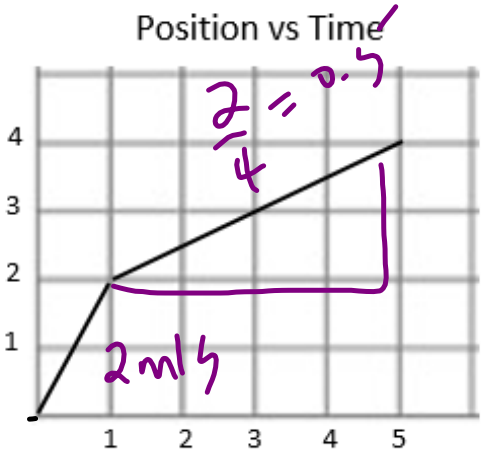
Position vs Time



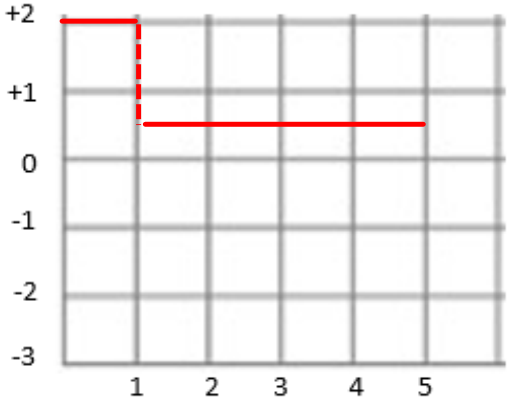
Velocity vs Time



Position vs Time



Velocity vs Time



Acceleration

(Page 462)

Acceleration is a change in velocity in a given time or rate of change of velocity. It is a vector quantity.

$$\vec{a} = \frac{\Delta \vec{v}}{t}$$

$$m = \frac{\Delta \vec{v}}{\Delta t}$$

$$\vec{a} = \frac{\vec{v}_f - \vec{v}_i}{t}$$

$$\vec{v}_f = \vec{v}_i + \vec{a}t$$

$\vec{a}$ ⇒ acceleration $\left(\frac{m}{s^2}, \frac{km}{h^2}\right)$

$\vec{v}_f$ ⇒ final velocity $\left(\frac{m}{s}, \frac{km}{h}\right)$

$\vec{v}_i$ ⇒ initial velocity (starting) $\left(\frac{m}{s}, \frac{km}{h}\right)$

t ⇒ time (s, h)

→ A car moving at 15 m/s ..... $\vec{v}_i$

→ A car with a velocity of 15 m/s .... $\vec{v}_i$

→ A car increases its velocity from 10 m/s to 15 m/s. $\vec{v}_i$ $\vec{v}_f$

Physics 122

Wednesday, April 27/16

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Explain That Stuff - April 28/16

1. Return - Midterms

2. Experiment 10.2 - Torques (Page 67)
   Experiment 9.1 - Conservation of Momentum (Page 55)
   Due - April 28/16

3. Assignment: Experiment 8.1 - Kepler's Laws - Page 49
   Due - May 2/16

4. Worksheet: Kepler's Laws