Physics 112

Friday, October 12/18

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1. FAs from Previous Sections

2. Return FA - Kinematic Equation #1
   Submit - LC and Justifications
   Graphical Tracking Sheet

3. Questions?
   Worksheet - Motion Problems - Complete for Monday

4. FA - Kinematic Equation #2

5. Acceleration due to Gravity

6. Freely Falling Bodies

7. Worksheet - Freeling Falling Bodies

Physics 122

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1. FA - Static Torque #2
   FA - Static Torque #1 and #2

2. SA - U1 S1&2 -> Tuesday, October 16/18 (~10 minutes/problem)
   - Calculate **R** using perpendicular components of two or more vectors.
   - Solve a push/pull problem.
   - Solve a suspended object problem (complex).
   - Solve an inclined plane problem.
   - Solve a static torque problem with only vertical forces.
   - Solve a static torque problem with forces acting at angles.

3. Worksheet - Relative Velocity (Textbook Problems)
   - See Next 2 Pages
   - Try Some

Textbook: C3 Page 110 - PP #21, 22, 25, 27(a) #1

PRACTICE PROBLEMS

21. A kayaker paddles upstream in a river at 3.5 m/s relative to the water. Observers on shore note that he is moving at only 1.7 m/s upstream. Determine the velocity of the current in the river.

22. A jet-ski speeds across a river at 11 m/s relative to the water. The jet ski's heading is due south. The river is flowing west at a rate of 5.0 m/s. Determine the jet-ski's velocity relative to the shore.

25. A swimmer is standing on the south shore of a river that is 120 m wide. He wants to swim straight across and knows that he can swim 1.9 m/s in still water. He drops a stick in the water and finds that it floats with the current to a point 24 m west in 30.0 s.

(a) Determine the direction in which the swimmer should head so that he lands directly across the river on the north bank.

(b) If he follows your advice, determine how long it will take him to reach the far shore.

27. A lone canoeist paddles from her cabin, heading directly east. When there is no wind, the velocity of the canoe is 1.5 m/s. However, a strong wind is blowing from the north, and the canoe is pushed southwards at a rate of 0.50 m/s. Calculate the velocity of the canoe relative to the shore.

Chapter 3

Practice Problems

21. 1.8 m/s[downstream]

22. 12 m/s[S24°W]

23. (a) N20.5°E
(b) 227 km/h[N30.0°E]
(c) 1.10 h

24. (a) 1.6×10^2 km[W18°N]
(b) 3.0×10^2 km/h[N], 2.2×10^2 km/h[W], 2.5×10^2 km/h[S]
(c) 1.3×10^2 km/h[W18°N]

25. (a) N25°E **(b)** 69 s

26. (a) 2.1 km[W54°N]
(b) S54°E
(c) 2.4 h

27. (a) 1.6 m/s[E18°S]

#2

Textbook: C3 Page 117 - PFU #23, 24, 29

PRACTICE PROBLEMS

23. Thao can swim with a speed of 2.5 m/s if there is no current in the water. The current in a river has a velocity of 1.2 m/s[S]. Calculate Thao's velocity relative to the shore if

(a) she swims upstream
(b) she swims downstream

24. A physics teacher is on the west side of a small lake and wants to swim across and end up at a point directly across from his starting point. He notices that there is a current in the lake and that a leaf floating by him travels 4.2 m[S] in 5.0 s. He is able to swim 1.9 m/s in calm water.

(a) What direction will he have to swim in order to arrive at a point directly across from his position?
(b) Calculate his velocity relative to the shore.
(c) If the lake is 4.8 km wide, how long will it take him to cross?

29. A canoeist wants to travel straight across a river that is 0.10 km wide. However, there is a strong current moving downstream with a velocity of 3.0 km/hr. The canoeist can maintain a velocity relative to the water of 4.0 km/hr.

(a) In what direction should the canoeist head to arrive at a position on the other shore directly opposite to his starting position?
(b) How long will the trip take him?

Chapter 3 Review

Problems for Understanding

23. (a) 1.3 m/s[N] **(b)** 3.7 m/s[S]
24. (a) [E26°N] **(b)** 1.7 m/s[E]
(c) 47 min
25. 4.4 m/s[N5.4°E]
26. 12 km[W24°N]
27. (a) 2.0×10^1 km[N16°E]
(b) 9.9 km/h[N16°E]
28. 0.217 m/s^2[S19.7°W]
29. (a) He should aim upstream at an angle 41° with respect to the river bank.
(b) 2.3 min

Science 10

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1. Word Equations
2. Chemical Equations
3. Law of Conservation of Mass
4. Examples - Balancing Chemical Equations

5. Worksheets - Balancing Chemical Equations