Physics 112

Friday, January 19/18

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1. Exam Review - Problem #9
2. Exam Review - Multiple Choice
3. Exam Prep

Exam Format
multiple choice = 30
problems = 9

1. $\vec{R}$ -> sketch and calculate
2. general kinematic problem
3. freely falling body problem
4. First Law problem
5. Second Law problem ($\vec{F}_{net} = m\vec{a}$ and kinematic equation)
6. Second Law problem ($\vec{F}_{net} = m\vec{a}$ and individual forces)
7. impulse-momentum problem
8. work-energy theorem problem
9. energy conservation problem

P112 - Exam Review - Problem #9

Work = Δ Ek

A 2.5 g bullet hits a tree and slows uniformly to a stop while penetrating a distance of 12 cm in to the tree's trunk. If a force of magnitude 1276 N was exerted on the bullet to bring it to rest, what was the initial speed of the bullet?

3.5×10^2 m/s

Physics 122

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1. The Physics Switcheroo
2. Timings - Science 10 Roller Coasters
3. Exam Review

P122 - Exam Review - Problem #1

Pull Problem

6.6×10^2 N

A 200 kg cart is pulled along a level surface by a rope angled at 15° above the horizontal. If the cart's speed increases at a rate of 1.6 m/s^2, what is the magnitude of the tension in the cable? Assume the coefficient of friction between the cart and the surface is 0.18.

P122 - Exam Review - Problem #2

2D Collision

2.1 m/s, 32° S of E

A 4.0 kg object is travelling south at a velocity of 2.8 m/s when it collides with a 6.0 kg object travelling East at a velocity of 3.0 m/s. If these two objects stick together upon collision, at what velocity do the combined masses move immediately after they collide?

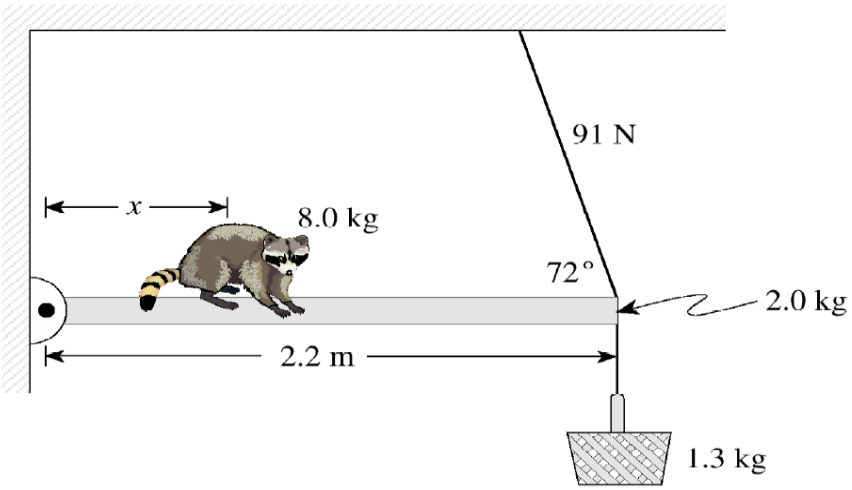
P122 - Exam Review - Problem #3

0.16

A concrete block accelerates down a 34^{o} slope at 4.2 m/s^2. Find the coefficient of friction between the block and slope.

P122 - Exam Review - Problem #4 1.8 m

A hungry 8.0 kg raccoon walks out on a 2.0 kg, 2.2 m long uniform beam in an attempt to reach a 1.3 kg food basket hanging at the end. A cord that can withstand 91 N is used to support the beam at the end as shown.



What is the maximum distance, x, the raccoon can walk out onto the beam before the cord breaks?

P122 - Exam Review - Problem #5

A boat heading due south crosses a river with a velocity of 3.0 m/s relative to the water. The river has a uniform velocity of 1.52 m/s due west. The river is 45 m wide.

a) Determine the boat's velocity with respect to an observer on shore.

b) How far down river is the boat once it makes it to the other side of the river?

a) 3.4 m/s, 27° WofS
63° SofW

b) 23 m

P122 - Exam Review - Problem #6

A bored kid, 30 m from a building, throws her ball at an angle of 50^{o} with a speed of 20 m/s at the building. At what height above the throwing level will the ball hit the wall?

9.0 m

P122 - Exam Review - Problem #7

A small charged sphere is placed at a point in an electric field that points due east and has a magnitude of 1.60×10^{14} N/C. If the sphere experiences an electrostatic force of 6.4 N west, what is the magnitude and sign of its charge?

-4.0×10^{-14} C

P122 - Exam Review - Problem #8

A block of unknown mass is attached to a spring with a spring constant of 6.5 N/m and undergoes SHM with an amplitude of 10.0 cm. When the block is halfway between its equilibrium and endpoint, its speed is measured to be 30.0 cm/s.
Calculate:
a) the mass of the block
b) the period of the motion

Science 10

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1. P4 -> Return -> SA - Physics #3
   P5 -> See me Monday to pick up SA

2. Roller Coasters

3. Practice Exam * Velocity-Time Graph will be on final exam.

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