Tuesday, September 11/12
Physics 122/121

1. Bell Work

2. Student Info Forms - Period 6

3. Check -> "Try's"
   Vectors - Perpendicular Components #4-6

4. Reminders re Force Problems

5. Force Problems: Type I

6. Text: C5 - Page 174, PP #17 → HW P6
   Page 208, PP #24 and 25
   Page 209, PP #36

HW P1

Physics 122/121

Handout: Force Problems - Type I

MHR - Chapter 5 - Page 174

17. A student pushes a 25 kg lawn mower with a force of 150 N. The handle makes an angle of 35° to the horizontal.

(a) Find the vertical and horizontal components of the applied force.

(b) Calculate the normal force supporting the lawn mower while it is being pushed.

(c) Calculate the net force propelling the mower if a frictional force of 85 N exists.

(d) Calculate the horizontal acceleration of the lawn mower. (Remember: Only part of the $F_{applied}$ is parallel to the direction of horizontal acceleration.)

a) 86 N, down
1.2 x 10^2 N, right
b) 3.3 x 10^2 N, up
c) 38 N, right
d) 1.5 m/s^2, right

MHR - Chapter 5 - Page 208

24. A toboggan with a mass of 15 kg is being pulled with an applied force of 45 N at an angle of 40° to the horizontal. What is the acceleration if the force of friction opposing the motion is 28 N?

0.43 m/s^2, right

25. A grocery cart is being pushed with a force of 450 N at an angle of 30.0° to the horizontal. If the mass of the cart and the groceries is 42 kg,

(a) Calculate the force of friction if the coefficient of friction is 0.60.

(b) Determine the acceleration of the cart.

a) 3.8 x 10^2 N, left
b) 0.23 m/s^2, right

MHR - Chapter 5 - Page 209

36. A 45.0 kg box is pulled with a force of 205 N by a rope held at an angle of 46.5° to the horizontal. The velocity of the box increases from 1.00 m/s to 1.50 m/s in 2.50 s. Calculate

(a) the net force acting horizontally on the box.

(b) the frictional force acting on the box.

(c) the horizontal component of the applied force.

(d) the coefficient of kinetic friction between the box and the floor.

a) 9.0 N, right
b) 132 N, left
c) 141 N, right
d) 0.451