PHYS 211 College Physics I
Exam 3B

October 25, 2017

Name _____ J. C. DALY _____

1. A 1750 kg car is moving due west with an initial speed of 28.0 m/s. After 10.0 s the car has slowed down to 15.0 m/s.

   Find the magnitude and direction of the force that produces the deceleration.

   a. Magnitude ___ 2280 N ___

   b. Direction ___ EAST ___

$m = 1750$ kg

$v_0 = 28.0$ m/s

$t = 10$ s

$v = 15.0$ m/s

$F = ma$
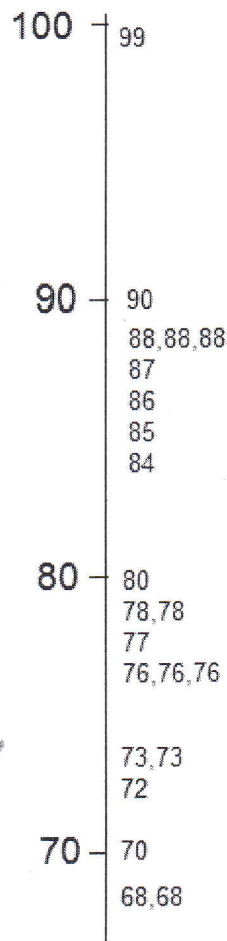
$a = \dfrac{v - v_0}{t} = \dfrac{15 - 28}{10} = -1.3$ m/s^2

$F = 1750 \times (-1.3) = -2,275$ N

$\vec{F} = -2,280$ N
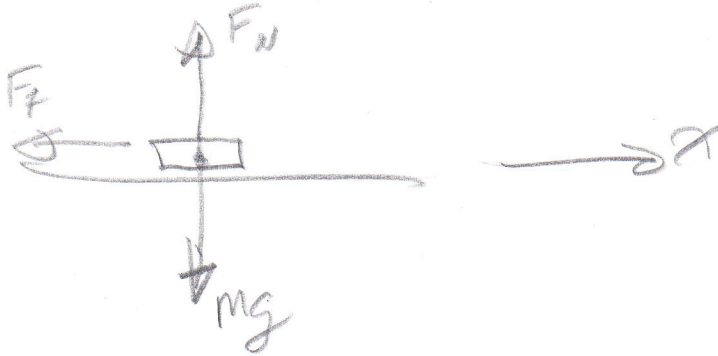EAST

October 25, 2017

2. A 0.80 kg hockey puck is sliding on ice. The coefficent of kinetic friction is 0.100.

  a. What is the friction force acting on the puck? ___0.784 N___

  b. What is the acceleration of the puck? ___-0.98×10^1 m/e^2___

$$F_f = \mu_r F_N$$

$$\Sigma F_y = F_N - mg = 0$$

$$F_N = mg$$

$$F_f = \mu_r F_N = 0.1 \times 0.8 \times 9.8 = 0.784 \ N$$

$$\Sigma F_x = -F_f = ma$$

$$a = -\frac{F_f}{m} = \frac{-0.784}{.8} = -0.98×10^1 \ m/s^2$$
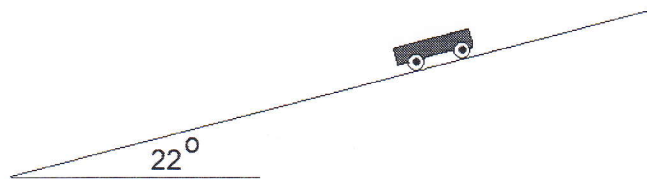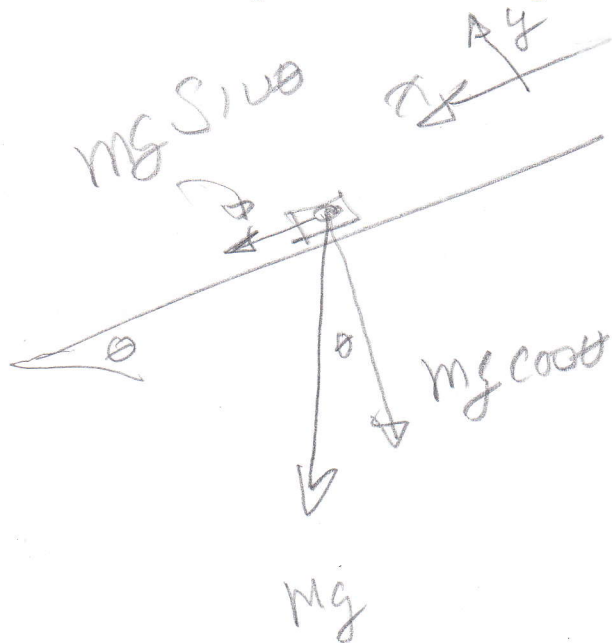
Figure 3

3. A 2.50 kg cart is rolling down the frictionless incline shown in Figure 3.

    a. What is its acceleration? ___$3.67 \ m/s^2$___

    b. Starting from rest, how long does it take for it to travel 1.50 m? ___$0.904 \ s$___

$$\sum F_x = mg\sin\theta = ma_x$$

$$a_x = g\sin\theta = 9.8 \sin 22° = 3.67 \ m/s^2$$

$$x = \tfrac{1}{2}at^2$$

$$t = \sqrt{\frac{2x}{a}} = \sqrt{\frac{2*1.5}{3.67}} = 0.904 \ s$$