

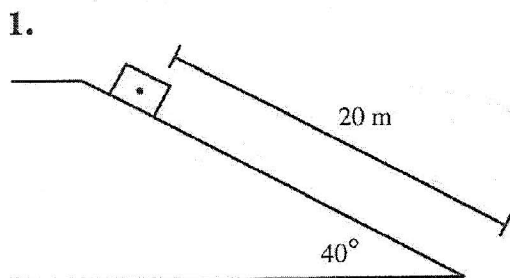
Physics AP B Review

Name: _____ Period: _____ Date: _____

Incline Planes

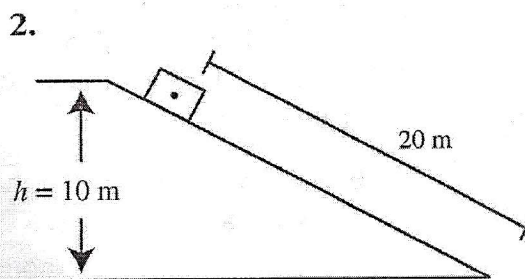
For each of the following situations, determine:

- the acceleration of the block down the plane
- the time for the time to slide to the bottom of the plane



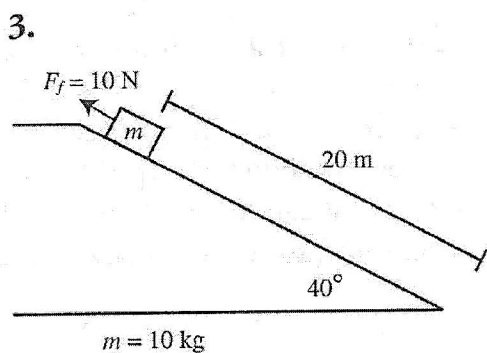
a. _____

b. _____



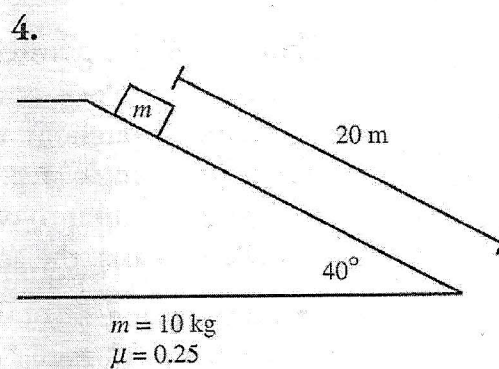
a. _____

b. _____



a. _____

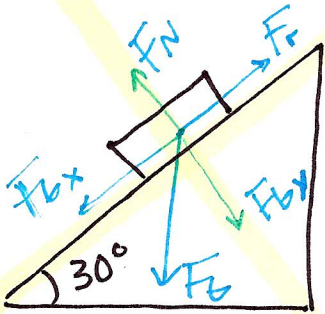
b. _____



a. _____

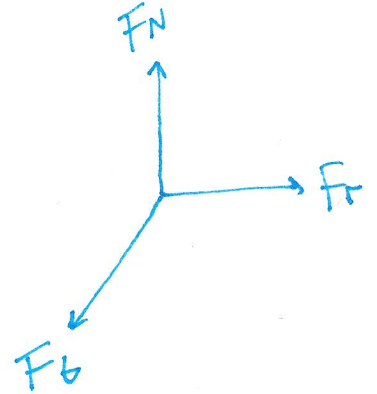
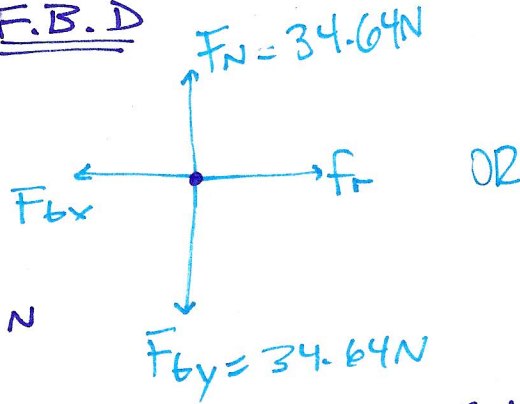
b. _____

Incline Plane



STEP 1:

F.B.D



$M = 4 \text{ kg}$ $F_b = 4(10) = 40 \text{ N}$
 $\mu_k = 0.5$

STEP 2: Find x & y components of the weight

$$F_{bx} = F_b \sin \theta = mg \sin \theta = 40 \sin 30^\circ = 20 \text{ N}$$

$$F_{by} = F_b \cos \theta = mg \cos \theta = 40 \cos 30^\circ = \underline{34.64 \text{ N}}$$

STEP 3: Find acceleration in x-axis

$$\sum F_x = m \cdot a$$

$$F_{bx} - f_r = m \cdot a$$

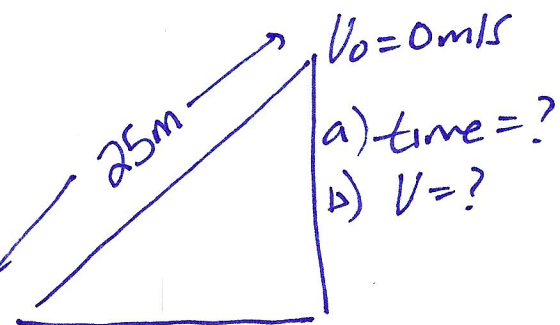
$$20 - 17.32 = 4 \cdot a$$

$$a = \underline{0.67 \text{ m/s}^2}$$

$$f_r = \mu_k \cdot F_N$$

$$f_r = (0.5)(34.64)$$

$$f_r = \underline{17.32 \text{ N}}$$



To find time:

$$X - X_0 = v_0 t + \frac{1}{2} a t^2$$

$$X = \frac{1}{2} a t^2$$

$$t = \sqrt{\frac{2X}{a}} = \sqrt{\frac{2(25)}{0.67}} = \underline{8.64 \text{ s}}$$

To find velocity

$$V = v_0 + a t$$

$$V = (0.67)(8.64) = \underline{5.79 \text{ m/s}}$$