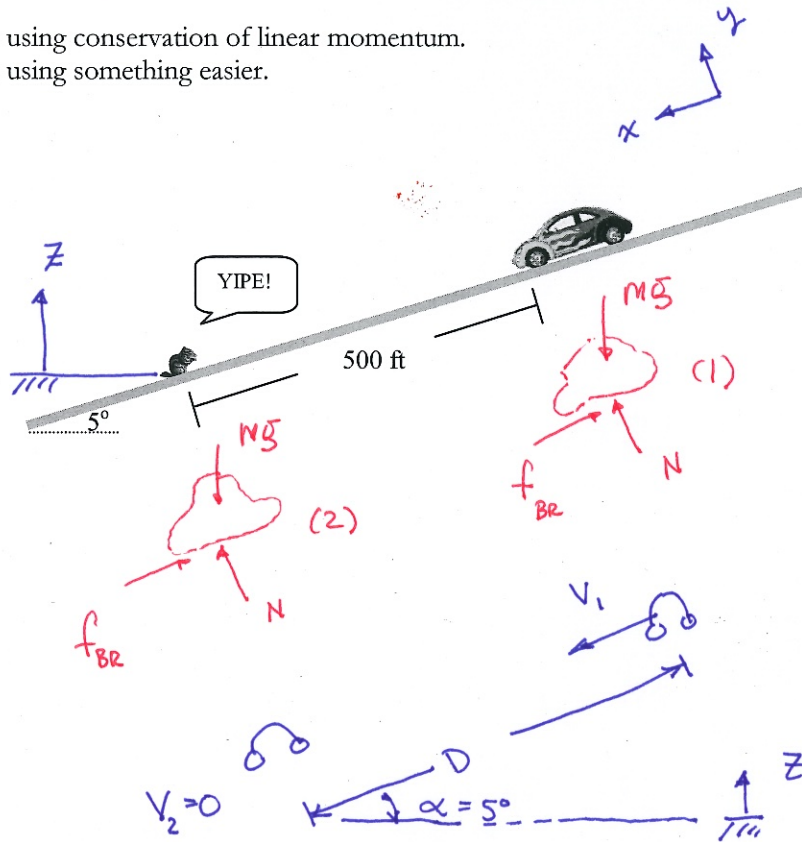


Example

Dr. Thom is traveling down a 5° incline in a wicked awesome new Beetle at a speed of 60 mph. Suddenly he sees a squirrel in the road and he applies a constant braking force of 1500 lbf. If the squirrel is 500 feet away when the brakes are applied, is he safe from being hit? The mass of the Beetle is 4000 lbf.

- Solve this problem using conservation of linear momentum.
- Solve this problem using something easier.



WORK-ENERGY PRINCIPLE FROM (1) TO (2)

$$W_{1-2, MECH} = KE_2 - KE_1 + PE_2 - PE_1$$

$$\int_{x=0}^D -F_{BR} \cdot dx = \frac{1}{2} mV_2^2 - \frac{1}{2} mV_1^2 + mgz_2 - mgz_1$$

FOR STOP DISTANCE

$$-f_{BR} \int_{x=0}^D dx = -\frac{1}{2} mV_1^2 - mg(D \sin \alpha)$$

$$f_{BR} \cdot D = \frac{1}{2} mV_1^2 + mg(D \sin \alpha)$$

$$D = \frac{\frac{1}{2} mV_1^2}{mg \sin \alpha + f_{BR}} = \dots = \boxed{418 \text{ ft}}$$