

IACAI Skill Review



This edition of the IACAI Skill Review has to do with momentum & energy. Good Luck!

1. A 2500 lb vehicle slid 150 feet while experiencing a drag factor of .70. How much work was done while the vehicle was sliding?
262, 500 ft/lbs

2. Given the answer to question #1, what was the velocity of V1 at first brake?
82.23 fps

3. V1, a 3500# car, is traveling EB on Center Street. V2, a 2500# car, is traveling NB on Meridian Street. V2 disregards the stop sign, striking V1. Both vehicles depart in a north easterly direction; V1 at 40 degrees, V2 at 25 degrees, with a combined post impact speed of 30 feet per second. Using a vector diagram, answer the following questions:
 - 3a. What is the amount of post impact energy developed by V1 & V2?
83, 850 ft/lbs
 - 3b. How fast was V1 traveling at impact?
42.8 fps
 - 3c. How fast was V2 traveling at impact?
41.28 fps

4. V1, a 4000# car, strikes the rear of 3000# V2 that was initially parked. Both vehicles move a distance of 50 feet post impact. Tests following impact found a surface drag factor of .4. The damage to V1 was similar to striking an immovable barrier at 25 fps. The damage to V2 was similar to striking an immovable barrier at 30 fps.
 - 4a. How much energy was dissipated while the vehicles were sliding together after impact?
140, 000 ft/lbs
 - 4b. How much energy was dissipated in doing damage to V1?
38, 319 ft/lbs
 - 4c. How much energy did V1 possess at impact?
220, 744 ft/lbs
 - 4d. What is the velocity of V1 at impact?
59.61 fps