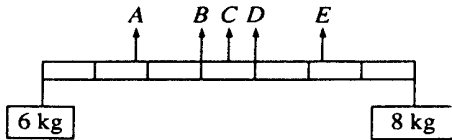


NVS Chapter 7-9 AP Test.

Answer all 5 of the following questions. Show your work for all. Upload the answers to me at jeff@szeryk.ca. If you want to write it on a page and then take a picture upload the picture to me.

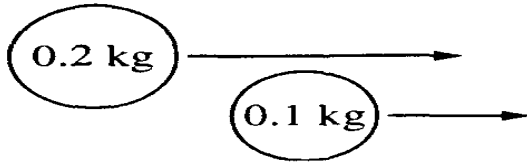


1)

57. Two objects, of masses 6 and 8 kilograms, are hung from the ends of a stick that is 70 centimeters long and has marks every 10 centimeters, as shown above. If the mass of the stick is negligible, at which of the points indicated should a cord be attached if the stick is to remain horizontal when suspended from the cord?

(A) A (B) B (C) C (D) D (E) E

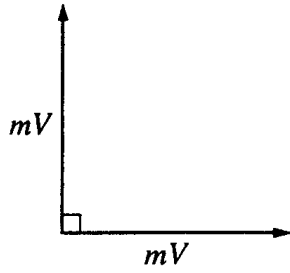
Show your work:



2) Two objects of mass 0.2 kg and 0.1 kg, respectively, move parallel to the x-axis, as shown above. The 0.2 kg object overtakes and collides with the 0.1 kg object. Immediately after the collision, the y-component of the velocity of the 0.2 kg object is 1 m/s upward. What is the y-component of the velocity of the 0.1 kg object immediately after the collision?

- (A) 2 m/s downward
- (B) 0.5 m/s downward
- (C) 0 m/s
- (D) 0.5 m/s upward
- (E) 2 m/s upward

Show your work:



3) A stationary object explodes, breaking into three pieces of masses m , m , and $3m$. The two pieces of mass m move off at right angles to each other with the same magnitude of momentum mV , as shown in the diagram above. What are the magnitude and direction of the velocity of the piece having mass $3m$?

- | | <u>Magnitude</u> | <u>Direction</u> |
|-----|------------------------|------------------|
| (A) | $\frac{V}{\sqrt{3}}$ | \nearrow |
| (B) | $\frac{V}{\sqrt{3}}$ | \nwarrow |
| (C) | $\frac{\sqrt{2} V}{3}$ | \nearrow |
| (D) | $\frac{\sqrt{2} V}{3}$ | \nwarrow |
| (E) | $\sqrt{2} V$ | \nearrow |

4) A ball of mass 0.4 kg is initially at rest on the ground. It is kicked and leaves the kicker's foot with a speed of 5.0 m/s in a direction 60° above the horizontal. The magnitude of the impulse imparted by the ball to the foot is most nearly

(A) $1 \text{ N} \cdot \text{s}$

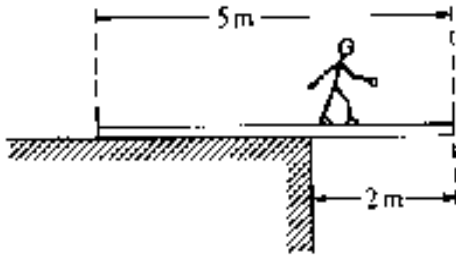
(B) $\sqrt{3} \text{ N} \cdot \text{s}$

(C) $2 \text{ N} \cdot \text{s}$

(D) $\frac{2}{\sqrt{3}} \text{ N} \cdot \text{s}$

(E) $4 \text{ N} \cdot \text{s}$

Show your work:



5)

13. A 5-meter uniform plank of mass 100 kilograms rests on the top of a building with 2 meters extended over the edge as shown above. How far can a 50-kilogram person venture past the edge of the building on the plank before the plank just begins to tip?

Show your work: