Guided Practice

Topic 2
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Multiple Choice questions

Paper 2 Questions
A speed boat tows a water skier so that the skier accelerates.

The magnitude of the force exerted on the skier by the tow rope must be

I. greater than the magnitude of the total resistive force acting on the skier
II. equal to the magnitude of the force exerted on the tow rope by the skier
III. equal to the magnitude of the force causing the boat to accelerate.

Which of the above factors is/are correct?

A. I and II only
B. I and III only
C. II only
D. III only
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Which of the following is a condition for an object to be in translational equilibrium?

A. The object must be moving at constant speed.
B. The velocity of the object in any direction must be zero.
C. The forces acting horizontally on the object must equal the forces acting vertically on the object.
D. The resultant force acting on the object must be zero.
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No external forces act on a given system during an inelastic collision. For this system, which is correct about the conservation of kinetic energy and the conservation of linear momentum?

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An object of mass $m_1$ has a kinetic energy $E_1$. Another object has a mass $m_2$ and kinetic energy $E_2$. The objects have the same momentum. What is the ratio $\frac{E_1}{E_2}$?

A. 1

B. $\sqrt{\frac{m_2}{m_1}}$

C. $\frac{m_2}{m_1}$

D. $\left(\frac{m_2}{m_1}\right)^2$
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C. \( \frac{m_2}{m_1} \)

D. \( \left( \frac{m_2}{m_1} \right)^2 \)
Two identical toy cars, A and B are dropped from the same height onto a solid floor without rebounding. Car A is unprotected whilst car B is in a box with protective packaging around the toy. Explain why car B is less likely to be damaged when dropped.

- impulse is the same/similar in both cases / momentum change is same;
- impulse is force $\times$ time / force is rate of change of momentum;
- time to come to rest is longer for car B;
- force experienced by car B is less (so less likely to be damaged);