

cq6-10

1. CJ6 7.CQ.015. [310935] A collision occurs between three moving billiard balls such that no net external force acts on the three-ball system. Is the momentum of *each* ball conserved during the collision?

- yes
 no

If so, explain why. If not, what quantity is conserved?

2. CJ6 7.CQ.016. [310940] In an elastic collision, is the kinetic energy of *each* object the same before and after the collision?

- yes
 no

Explain.

3. CJ6 7.CQ.018. [311007] Where would you expect the center of mass of a doughnut to be located?

- the center of the hole
 around the edge

Why?

4. CJ6 7.CQ.019. [311020] Would you expect the center of mass of a baseball bat to be located halfway between the ends of the bat, nearer the lighter end or nearer the heavier end?

- near the lighter end
 in the center
 near the heavier end

Provide a reason for your answer.

5. CJ6 7.CQ.020. [310895] A sunbather is lying on a floating raft that is stationary. She then gets up and walks to one end of the raft. Consider the sunbather and raft as an isolated system.

(a) What is the velocity of the center of mass of this system while she is walking?

- negative
- positive
- zero

Why?

(b) Does the raft itself move while she is walking?

- yes
- no

If so, what is the direction of the raft's velocity relative to that of the sunbather?

- opposite the direction of the sunbather
- in the same direction as the sunbather

Provide a reason for your answer.