

cq5-26

1. CJ6 2.CQ.011. [310999] Review Concept Simulation 2.2 at www.wiley.com/college/cutnell before answering this question. An experimental vehicle slows down and comes to a halt with an acceleration whose magnitude is 9.80 m/s^2 . After reversing direction in a negligible amount of time, the vehicle speeds up with an acceleration of 9.80 m/s^2 . Other than being horizontal, how is this motion different, if at all, from the motion of a ball that is thrown straight upward, comes to a halt, and falls back to earth?

2. CJ6 2.CQ.012. [311048] A ball is dropped from rest from the top of a building and strikes the ground with a speed v_f . From ground level, a second ball is thrown straight upward at the same instant that the first ball is dropped. The initial speed of the second ball is $v_0 = v_f$, the same speed with which the first ball will eventually strike the ground. Ignoring air resistance, decide whether the balls cross paths at half the height of the building, above the halfway point, or below the halfway point.

- above the halfway point
- at half the height of the building
- below the halfway point

Give your reasoning.

3. CJ6 2.CQ.013. [311012] Review Concept Simulation 2.3 at www.wiley.com/college/cutnell before answering this question. Two objects are thrown vertically upward, first one, and then, a bit later, the other. Is it possible that both reach the same maximum height at the same instant?

- yes
- no
- not enough information to decide

Account for your answer.

4. CJ6 2.CQ.014. [311056] The muzzle velocity of a gun is the velocity of the bullet when it leaves the barrel. The muzzle velocity of one rifle with a short barrel is greater than the muzzle velocity of another rifle that has a longer barrel. In which rifle is the acceleration of the bullet larger?

- rifle with the longer barrel
- acceleration of the bullet is the same for both rifles
- rifle with the shorter barrel

Explain your reasoning.
