PH 221 Week 10

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R10-1: Cliffside Midair Collision

You are standing at the bottom of a cliff, your friend is standing at the top, and each of you is in possession of a ball. Your friend drops the ball off of the edge, and at the exact same time, you throw your ball up toward it such that they collide in midair.

(a) At what height do the two balls collide? How fast is your ball going when the two balls collide?

(b) If you want your friend's ball to bounce back to the top of the cliff after the collision, how much kinetic energy must it have after the collision? What is its velocity after the collision?

(c) How fast do you have to throw your ball in order for your friend's ball to bounce back to the top of the cliff? Assume the collision is perfectly elastic.

(d) Perform sensemaking (use multiple techniques!) on your answer for initial speed of the launched ball.