Physics 10154 – Exam #1C

Partial credit will be given provided you show all work and are solving parts of the problem correctly. Points will be deducted if you don't show your work (or if some parts are incorrect) even if you get the right answer. Clearly indicate your answer with a circle or box and remember to include correct units and significant figures.

1. (30 pts) Starting at the origin, a person walks 347 meters in a direction 32.0° South of West, then 565 meters in a direction 55.0° North of West. If the person now wishes to walk in a straight line back to the origin, what must be the magnitude and direction of the displacement?

2. (35 pts) A 5.0-kg ball is dropped from rest. The ball
reaches the halfway point between the starting point and the
ground in 2.2 seconds.

a) What is the change in kinetic energy during the first half
    of the ball's motion?
b) What is the change in kinetic energy during the second half
    of the ball's motion?

3. (35 pts) A rock is launched toward a vertical brick wall
with a speed of 14.0 m/s at an angle of 34.5° above the
horizontal. If you want the rock to hit the highest possible
point on the wall,

a) How far away from the wall (horizontally) must you launch
    the rock?
b) What is the speed of the rock when it hits the wall when
    launched from the place calculated in part (a)?