

## Physics 10154 - Exam #1D

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) A boat crossing a wide body of water is attempting to get to a small island that is 357 miles due West from its initial location. The boat travels 192 miles in a direction  $15.0^\circ$  North of West, then 218 miles in a direction  $27^\circ$  South of West. What must the final straight line displacement of the boat be in order to find the island?

2. (35 pts) A person standing on a cliff fires a pellet gun straight down toward the ground from an altitude of 27.0 meters. The pellet's speed the instant before it hits the ground is 42.5 m/s.

- a) How far above the cliff edge would the pellet have gone had the gun been fired straight upward?
- b) What is the final velocity (magnitude and direction) of the pellet fired upwards just before it hits the ground?

3. (35 pts) A diver springs upward from a board that is 3.35 meters above the water. At the instant she contacts the water, her velocity is 12.1 m/s in a direction  $81.5^\circ$  below the horizontal. Determine the magnitude and direction of her initial velocity.

