Chapter 3 Problem III (+1) Name _____

1. Find the component velocities of a helicopter traveling 95 km/h at an angle of 35° to the ground.

2. How fast must a truck travel to stay beneath an airplane that is moving 105 km/h at an angle of 25° to the ground?

3. What is the magnitude of the vertical component of the velocity of the plane in question #2?

4. Find the horizontal and vertical components of the 125 m displacement of a superhero who flies down from the top of a tall building at an angle of 25° below the horizontal.

5. A child rides a toboggan down a hill that descends at an angle of 30.5° to the horizontal. If the hill is 23.0 m long, what are the horizontal and vertical components of the child's displacement?

6. A truck drives up a hill with a 15° incline. If the truck has a constant speed of 22 m/s, what are the horizontal and vertical components of the truck's velocity?

7. A skier squats low and races down an 18° ski slope. During a 5 s interval, the skier accelerates at 2.5 m/s^2. What are the horizontal (perpendicular to the direction of free-fall acceleration) and vertical components of the skier's acceleration during this time interval?

8. What are the horizontal and vertical components of a cat's displacement when it is climbing 5 m directly up a tree?

9. A submarine dives 110.0 m at an angle of 10.0° below the horizontal. What are the horizontal and vertical components of the submarine's displacement?

10. A person walks 25.0° north of east for 3.10 km. How far would another person walk due north and due east to arrive at the same location?

11. A roller coaster travels 41.1 m at an angle of 40.0° above the horizontal. How far does it move horizontally and vertically?