

**Worksheet week 15** MAC-2311 Spring 2016 **Name:** \_\_\_\_\_

1. A plane flying horizontally with a speed of 300 ft/s at an elevation of 9600 ft over flat ground releases an emergency probe. Imagine the probe looks like a small arrow. The trajectory of the probe is given by the parametric curve

$$x(t) = 300t, \quad y(t) = -16t^2 + 9600, \quad \text{for } t \geq 0,$$

where the origin is the point on the ground directly beneath the plane at the moment of the release, and  $t$  is the time in seconds since the moment of release.

- (a) Graph the trajectory of the probe and find the coordinates of the point where the probe lands.
- (b) Find  $dx/dt$ ,  $dy/dt$ . Explain their practical meaning and explain why the formulas you get for each of them make sense.
- (c) At what angle does the probe hit the ground?