EMT112 – Problem Set VI

November 26, 2010

1. A spherical balloon is inflated so that its volume is increasing at the rate of 3 cu.ft /min. How fast is the diameter of the balloon increasing when the radius is 1 ft?

2. An aircraft is climbing at a 30° angle to the horizontal. How fast is the aircraft gaining altitude if its speed is 500 mph ?

3. An open box is to be made from a 3-ft by 8-ft rectangular piece of sheet metal by cutting out squares of equal size from the four corners and bending up the sides. Find the maximum volume that the box can have.

4. A plank is used to reach over a fence 8 ft high to support a wall that is 1 ft behind the fence. What is the length of the shortest plank that can be used?

5. Use your knowledge of solids of revolution to find the volume of a sphere.

6. A round hole of radius a is drilled through the center of a solid sphere of radius r. Find the volume of the resulting solid.