Math 140 Session 9 (Related Rates) Date: November 20th, 2015 Omidali Jazi

Problem 1. The radius of a circle increases at 2 cm/sec. At what rate is the area increasing when the radius is 3 cm? .

Problem 2. A helium balloon is released from ground level and rises at a constant rate of 2 feet per second. A video camera at the top of a 100-foot tower which is located 60 feet from the point where the balloon was released. At what rate is the distance between the video camera and the balloon changing when the balloon is 55 feet above the ground?

Problem 3. A bowl of petunias is dropped from a point 12 feet above the ground, so that it will land 4 feet from the base of a 12 foot lamppost. At what rate is the shadow of the bowl moving along the ground when the bowl is 8 feet above the ground?

Problem 4. Two cars are moving on long parallel roads in opposite directions at 20 feet per second and 80 feet per second respectively. The roads are 200 feet apart. How rapidly is the distance between them changing 5 seconds after they pass one another?

Problem 5. A spotlight on the top of a police cruiser makes one revolution per second. The spotlight is 40 feet from a long straight wall. At what rate is the spot of light moving across the wall at the instant when the beam makes a 30 degree angle with the wall?