In-Class Assignment 7

MATH 141

Directions: Work neatly on a separate sheet of paper. Your group will hand in one write-up with everyone's name on it. **DO NOT** fold the corner over to hold everything together! Your final write-up should be very neat and well-written. Remember to use complete sentences as appropriate.

Work together on each problem; do not delegate different problems to different people.

1. Workers pump oil out of a cylindrical oil tank at the rate of 3000 liters per minute. If the tank has a radius of 2.4m, how fast is the level of the oil dropping?

2. A paper cup has the shape of a cone with a height of 10 cm and radius of 3 cm at the top. If water is poured into the cup at a rate of 2 cm^3/s, how fast is the water level rising when the cup is 5 cm deep?

3. A man starts walking north at 4 ft/s from a point P. Five minutes later, a woman starts walking south at 5 ft/s from a point 500 feet due east of P. At what rate are the people moving apart 15 minutes after the woman starts walking?

4. Colin the Clown inflates a spherical balloon at the rate of 100π ft^3 per minute. How fast is the radius of the balloon changing when the radius is 5 feet?

5. A highway patrol plane flies 3 miles above a level, straight road at 120 mph. The plane is equipped with radar, which measures the the distance to an oncoming car as 5 miles, which is decreasing at 160 mph. How fast is the car traveling along the highway?