STEM ED/CHM Nanotechnology at UMass Amherst

Oleic Acid Thin Film Worksheet
(with hints for doing the calculations)

Step 1	Write the fraction of oleic acid in 1.0 cm^3 of the first solution. Put the volume of oleic acid in the numerator. Put the total volume of the solution in the denominator.	
Step 2	Change the fraction of oleic acid from Step 1 to a decimal form. Divide the numerator in Step 1 by the denominator in Step 1.	
Step 3	Determine the volume of oleic acid in 1.0 cm^3 of the second solution. Divide your answer to Step 2 by the total volume of the second solution.	
Step 4	Record the number of drops in 1.0 cm^3 of the second solution.	
Step 5	Determine the volume of oleic acid in one drop of the second solution. (Divide the answer to Step 3 by the number of drops recorded in Step 4.)	
Step 6	Record the average radius of the circular area of the thin film (in centimeters). The average radius is half of the average diameter.	
Step 7	Calculate the area of the thin layer of oleic acid (in square centimeters). Use the formula for the volume of a circle. Area = $(\pi) \times R^2$	
Step 8	Calculate the thickness (depth) of the thin layer of oleic acid (in centimeters). Use the formula for the depth of a cylinder: Depth = Volume / Area	
Step 9	Convert the thickness of the layer of oleic acid from centimeters to meters. Remember that a centimeter is 2 Powers of Ten **smaller** than a meter.	