Directions: Show all your work! Circle answers. 10 points each.

1.   The third-order fringe of 450 nm light is observed at an angle of 12 degrees when the light falls on two narrow slits. How far apart are the slits?

2.   In a water tank experiment, water waves are generated with their crests 1.5 cm apart and parallel. They pass through two openings 3.0 cm apart in a long wooden board. If the end of the tank is 3.0 m beyond the boards, where would you stand, relative to the "straight-through" direction, so that you received little or no wave action?

3.   If 520-nm light falls on a single slit 0.0440 mm wide, what is the angular width of the central diffraction peak?

4.   Light of wavelength 580-nm falls on a slit that is 2.5×10^{-3} mm wide. How far from the central maximum will the first diffraction maximum fringe be if the screen is 5.0 m away?

5.   How many lines per centimeter does a grating have if the third-order occurs at a 27 degree angle for 570-nm light?

Bonus: You have fifty coins totaling $1.00. You drop one down an open drain while tossing the coins in your hand. What is the chance that you have lost a quarter? (do your research, the same question will be on the quiz, $\therefore$ no answer will be given at this time. 5 points.