

### Homework 3

Complete the following problems. Write your solutions on a separate page. Make sure you clearly explain your reasoning when applicable and show all of your work. Your explanation and work is more important than your answer.

*(Excerpt of homework problems relevant to QCR ILO 2 shown below)*

1. We're getting ready for fall season! At a St. Olaf social event, Ole and Sven are distributing hot chocolate from a huge tank. The tank has the shape of an inverted right circular cone with a height of 2 meters and radius 1.5 meters (inverted means tip down). It is initially filled to a height of 1.8 meters with hot chocolate. Find the work required to completely empty the tank by pumping the hot chocolate over the top of the tank. The density of hot chocolate is  $1080 \text{ kg/m}^3$ .

Since this is a longer problem, structure your work in the following way:

- (a) Briefly describe your approach to the problem.
- (b) Set up a mathematical expression that describes the quantity you want to find.
- (c) Evaluate this mathematical expression and conclude. Your final answer must include the correct units.