Here are some additional practice problems (with answers at the bottom) for text section 6.5, “Work”. This is not an assignment to be turned in for a grade. It is simply some material that you may utilize when preparing for the upcoming exam. (Note that there are no spring problems on this page. This is because there are plenty of them in the text exercises.)

1. A spherical tank of radius 8 feet is half full of oil that weighs 50 pounds per cubic foot. Find the work required to pump all the oil out through a hole in the top of the tank.

2. A 20-foot chain weighing 5 pounds per foot is lying coiled on the ground. How much work is required to raise one end of the chain to a height of 20 feet so that it is fully extended?

3. A rectangular tank with a base 4 feet by 5 feet and a height of 4 feet is full of water. (The water weighs 62.4 pounds per cubic foot.) How much work is done in pumping water out over the top edge in order to empty all of the tank?

4. An open tank has the shape of a right circular cone (with the point at the bottom). The tank is 8 feet across the top and 6 feet high. How much work is done in emptying the tank by pumping the water over the top edge?

5. Consider a demolition crane with a 500-pound ball suspended from a 40-foot cable that weighs 1 pound per foot. Find the work required to wind up 15 feet of the apparatus.

ANSWERS: 1. $\frac{\pi \cdot 563,200}{3}$ foot-pounds, 2. 1000 foot-pounds, 3. 9,984 foot-pounds, 4. $2995.2\pi$ foot-pounds, 5. 7987.5 foot-pounds.