

1. A 5-lb bucket is lifted from the ground into the air by pulling in 20 ft of rope at a constant speed. The rope weighs 0.08 lb/ft. How much work was spent lifting the bucket and the rope?
2. How much work is performed pulling a 60 feet rope weighing 66 lbs/ft up a cliff face? At what point has half of the work been completed?
3. A cable weighing 6 lb/ft is connected to a construction elevator weighing 1500 lbs. Find the work done in lifting the elevator to a height of 500 ft.
4. A conical tank of height 20 feet and radius 8 feet, with the point at the top, is filled up to 17 feet with Dr. Pepper (63 lb/ft^3). Compute the amount of work required to pump all of the Dr. Pepper to a height of 3 feet above the top of the tank.
5. Redo the previous problem but with the tank flipped so it has the point at the bottom. Before doing it, think about which one should take more work. Do your answers support your guess?
6. A cylindrical tank of diameter 7 feet and height 13 feet is filled up to 11 feet with lead (58.9 lb/ft^3). Compute the amount of work required to pump all of the lead to a height of 5 feet above the top of the tank.
7. A hemispherical tank (with flat side up) of radius 20 ft is filled with water (weighing about 62.4 lb/ft^3) to a 15 ft depth. Find the work done in pumping all the water to the top of the tank.
8. Refer to previous problem. Find the work done in pumping all the water to a point 10 ft above the hemispherical tank.