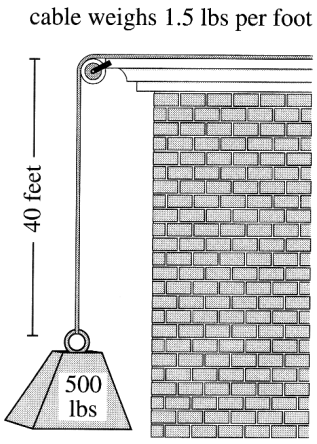
Work on Work Work Day

Be sure you begin each problem by setting up a *work element,* dW. If you understand the concept of *center of mass,* feel free to use it to *check* your answers.

1. A 40 foot cable weighting 60 pounds hangs vertically from the top of a building. A 500 pound weight is attached at the end of the cable as shown in the picture.



   (a) How much work is done to pull the weight to the top of the building? (Ignore the cable.)

   (b) How much work is done to pull the cable to the top of the building? (Ignore the 500 pound weight.)

2. Water weighs 62.5 pounds per cubic foot. Sketch a cylinder with a radius of 10 feet, and a height of 8 feet. Now imagine it is filled with 5 feet of water, and you have a hose with a pump coming in from the top of the cylinder. How much work is required to pump out 2 feet of water? (There should be a π inyour answer.)

3. A bucket that weighs 4 lb and a rope of negligible weight are used to draw water from a well that is 80 ft deep. The bucket starts with 40 lb of water and is pulled up at a rate of 2 ft/s, but water leaks out of a hole in the bucket at a rate of 0.2 lb/s. Find the work done (in ft-lb) in pulling the bucket to the top of the well.