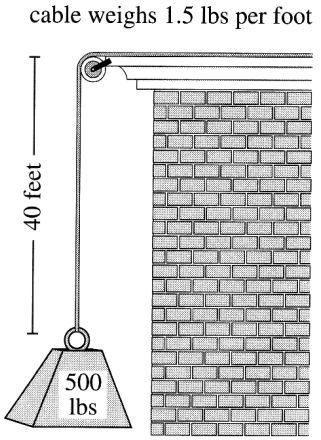
1. (a) *Without using a calculator,* sketch a *large* graph of $y = 3\cos^2(2x)$ for $x \in [0, \pi]$ on a graph whiteboard.

   (b) Using a different color marker and a ruler, add the line $y = 3$ for $x \in [0, \pi]$ to you sketch.

   (c) Using *just* your drawing, a little bit of trig, and some thought evaluate:

$$\int_0^{\pi} 3\cos^2(2x)\,dx$$

2. 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.)