1. (3 points) An inverted conical tank has a 5 foot radius at the top and is 10 feet high. It is filled to within 2 feet of the top with olive oil weighing 57 lb/ft$^3$. How much work does it take to pump the oil to the rim of the tank?
2. (3 points) A bathroom scale is compressed $1/16$ in. when a 150-pound person stands on it. Assuming the scale behaves like a spring,

(a) How much does someone who compresses the scale $1/8$ in. weigh?

(b) How much work does it take to compress the scale $1/8$ in?

3. (4 points) Find the average value of the function $f(x) = 5 \sin \left( \frac{x}{2} \right)$ on the interval $[0, 2\pi]$. 