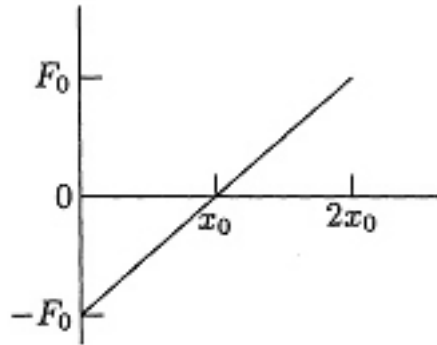


33. (a) The graph shows F as a function of x assuming x_0 is positive. The work is negative as the object moves from $x = 0$ to $x = x_0$ and positive as it moves from $x = x_0$ to $x = 2x_0$.



Since the area of a triangle is (base)(altitude)/2, the work done from $x = 0$ to $x = x_0$ is $-(x_0)(F_0)/2$ and the work done from $x = x_0$ to $x = 2x_0$ is $(2x_0 - x_0)(F_0)/2 = (x_0)(F_0)/2$. The total work is the sum, which is zero.

(b) The integral for the work is

$$W = \int_0^{2x_0} F_0 \left(\frac{x}{x_0} - 1 \right) dx = F_0 \left(\frac{x^2}{2x_0} - x \right) \Bigg|_0^{2x_0} = 0.$$