

$14 = f(x) = kx = (\frac{1}{6})k$ [2 inches = $\frac{1}{6}$ foot], so $k = 84$ lb/ ft and $f(x) = 84x$. Now 8 inches = $\frac{2}{3}$ foot, so $W = \int_0^{2/3} 84x dx = [42x^2]_0^{2/3} = \frac{56}{3}$ ft-lb.