43. (a) and (b) Hooke's law and the work done by a spring is discussed in the chapter. We apply Work-kinetic energy theorem, in the form of $\Delta K = W_a + W_s$, to the points in Figure 7-48 at $x = 1.0$ m and $x = 2.0$ m, respectively. The "applied" work W_a is that due to the constant force $\vec{P}$.

$$\begin{aligned} 4 &= P(1.0) - \frac{1}{2}k(1.0)^2 \\ 0 &= P(2.0) - \frac{1}{2}k(2.0)^2 \end{aligned}$$

Simultaneous solution leads to $P = 8.0$ N and $k = 8.0$ N/m.