36. (a) Since the force exerted by the spring on the mass is zero when the mass passes through the equilibrium position of the spring, the rate at which the spring is doing work on the mass at this instant is also zero.

(b) The rate is given by $P = \vec{F}\cdot\vec{v} = -Fv$, where the minus sign corresponds to the fact that $\vec{F}$ and $\vec{v}$ are antiparallel to each other. The magnitude of the force is given by $F = kx = (500\,\text{N/m})(0.10\,\text{m}) = 50\,\text{N}$, while v is obtained from conservation of energy for the spring-mass system:

$$E = K + U = 10\,\text{J} = \frac{1}{2}mv^2 + \frac{1}{2}kx^2 = \frac{1}{2}(0.30\,\text{kg})v^2 + \frac{1}{2}(500\,\text{N/m})(0.10\,\text{m})^2$$

which gives $v = 7.1\,\text{m/s}$. Thus

$$P = -Fv = -(50\,\text{N})(7.1\,\text{m/s}) = -3.5\ \times 10^2\,\text{W}\ .$$