A long rod of mass $M$ and length $L$ is pivoted freely at its center. One end of the rod is connected to a spring of force constant $k$ which is rigidly mounted as shown. The rod is displaced from its equilibrium position by a small angle and released. Calculate the period of small oscillations about the equilibrium position.

*Ignore gravity: only consider the effect of the spring on the rod.*

*Note:* The moment of inertia of such a rod about its center of mass is $I = ML^2/12$. 

Answer: ________________________________