An object attached to a coiled spring is pulled up a distance of 3 units from its rest position and then released. Assuming that the motion is simple harmonic with period $T = 5$ seconds, write an equation that describes the displacement $d$ of the object from its rest position after $t$ seconds. Also assume that the direction of positive motion is up.

**SOLUTION:**
Since the object is pulled up and released, and since the direction of positive motion is up, then the function has the form $d = A \cos(\omega t)$, where $A > 0$. Since the object is released 3 units from its rest position, then $A = 3$.

Since the period is $T = 5$ seconds and since $T = \frac{2\pi}{\omega}$, then $\frac{2\pi}{\omega} = 5$. So then $\omega = \frac{2\pi}{5}$.

Putting all of this together results in the function $d = 3 \cos\left(\frac{2\pi}{5} t\right)$. 