Question 27040

According to frictional force, the motion will be with negative acceleration. For vertical axis $N=P=m\,g$. The force of friction is $F_f=\mu N=\mu P=\mu\,m\,g$. The law of accelerated motion is $v=v_0-a\,t$, where $v_0=18\frac{m}{s}$ is the velocity at the bottom of the hill. According to 2nd Newton's Law, $a=\frac{F_f}{m}=\mu\frac{P}{m}=\mu\,g$. At the moment of stop, $v=0\Rightarrow t=\frac{v_0}{a}=\frac{v_0}{\mu\,g}\approx 40.8\,s$. Thus, time needed to stop is $t=40.8\,s$.