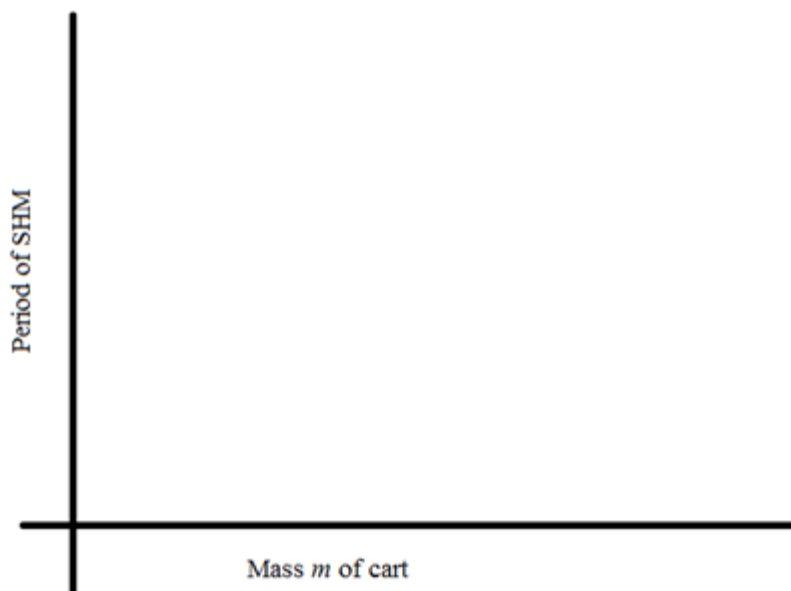


A lab cart of variable mass m on a frictionless surface is attached to a spring, as shown above. The rightward direction is considered positive. The spring is neither stretched nor compressed at position $x = 0$. The cart is released from rest at the position $x = +0.25 \text{ m}$ at time $t = 0$.

1. On the axes below, sketch what a graph of the period of the cart's simple harmonic motion would look like as a function of the mass m of the cart.



2. It is desired to make a new graph involving period and mass that would be linear.

(a) What should be graphed on each axis of the linear graph?

(b) What is the physical meaning of the slope of the linear graph you described?