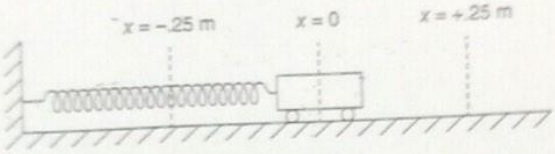
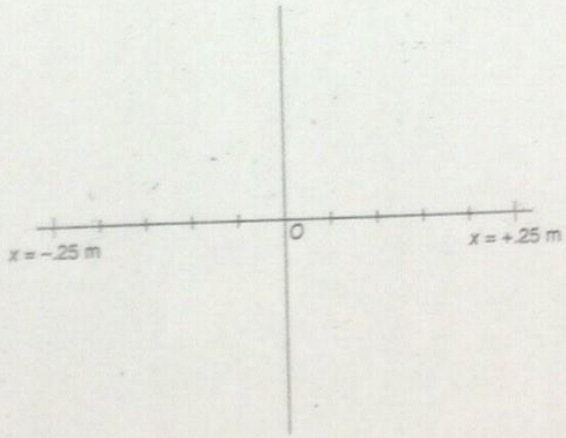
SHM Graphs WS

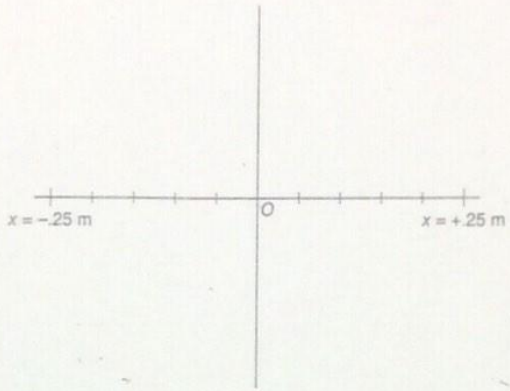


A 0.50-kg lab cart on a frictionless surface is attached to a spring, as shown in the preceding figure. The rightward direction is considered positive. The spring is neither stretched nor compressed at position $x = 0$. The cart is released from rest at the position $x = +0.25$ m at time $t = 0$.

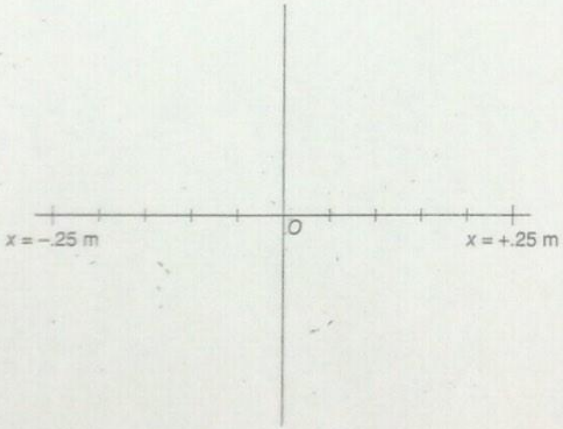
1. On the axes below, sketch a graph of the kinetic energy of the cart as a function of position x.



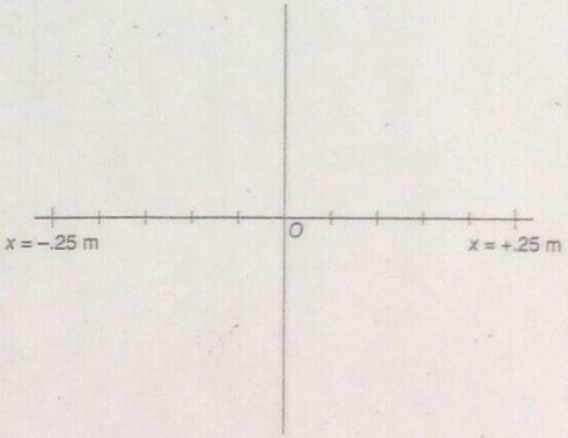
2. On the axes below, sketch a graph of the total mechanical energy of the cart-spring system as a function of position x.



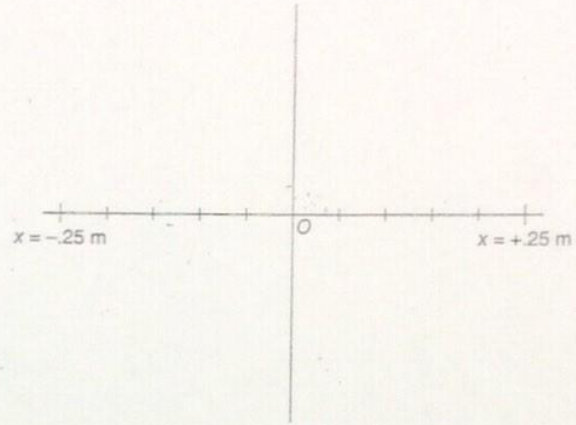
3. On the axes below, sketch a graph of the speed of the cart-spring system as a function of position x.



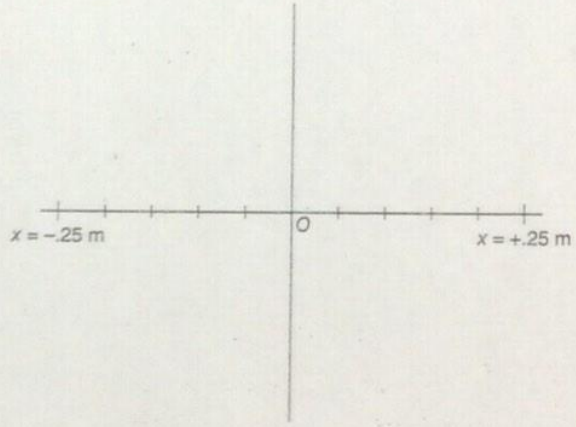
4. On the axes below, sketch a graph of the force applied by the spring on the cart as a function of position x.



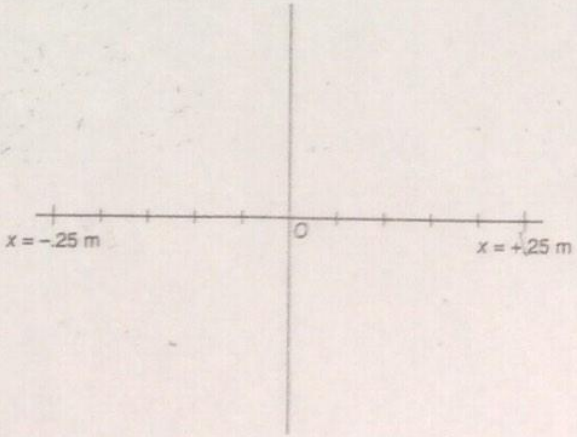
5. On the axes below, sketch a graph of the force applied by the cart on the spring as a function of position x.



6. On the axes below, sketch a graph of the spring constant of the spring as a function of position x.



7. On the axes below, sketch a graph of the acceleration of the cart-spring system as a function of position x.



8. On the axes below, sketch a graph of the potential energy of the cart-spring system as a function of position x.