12.1

Question:

A block on the end of a spring is pulled to position $x = A$ and released. In one full cycle of its motion, through what total distance does it travel?

(A) A/2

(B) A

(C) 2A

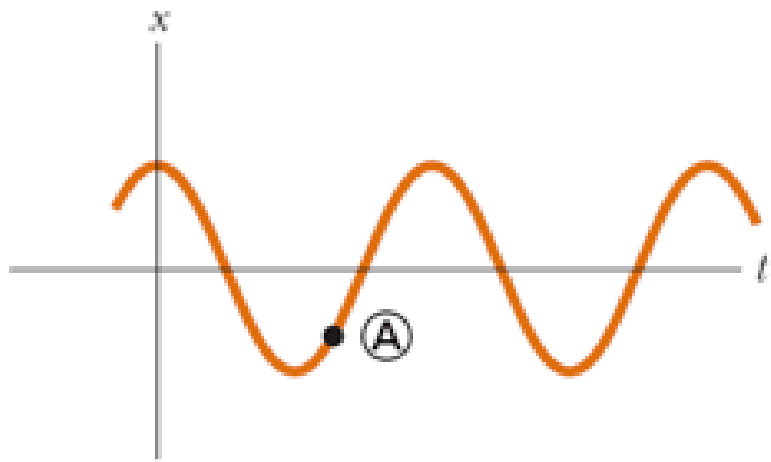
(D) *4A*

12.2

Question:

Consider the following graphical representation of simple harmonic motion as described mathematically, $x(t) = A\cos(\omega t + \phi)$. When the object is at point A on the graph, what are, respectively, its position and velocity?

(A) both positive
(B) both negative
(C) positive and zero
(D) positive and negative
(E) *negative and positive*



12.3

Question:

What are the respective signs of the velocity and acceleration when the object is at position A on the graph?

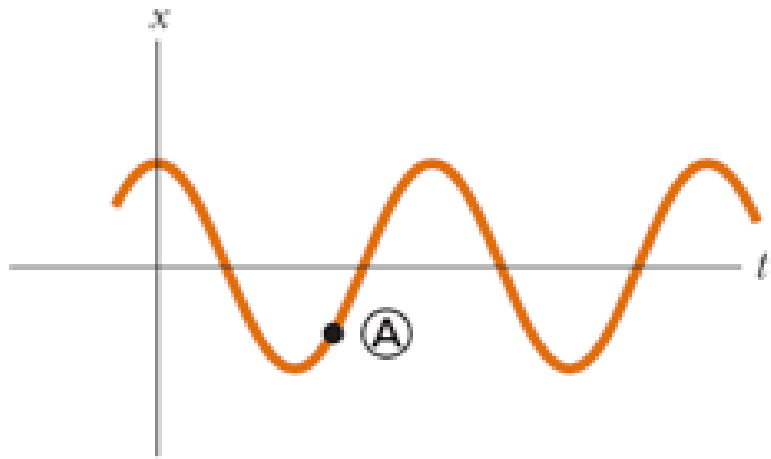
(A) *both positive*

(B) both negative

(C) positive and zero

(D) positive and negative

(E) negative and positive



12.4

Question:

A grandfather clock depends on the period of a pendulum to keep correct time. Suppose a grandfather clock is calibrated correctly and then a mischievous child slides the bob of the pendulum downward on the oscillating rod. Does the grandfather clock run...

(a) *slow*

(b) fast

(c) correctly

12.5

Question:

A grandfather clock depends on the period of a pendulum to keep correct time. Suppose the grandfather clock is calibrated correctly at sea level and is then taken to the top of a very tall mountain. Does the grandfather clock run...

(a) *slow*

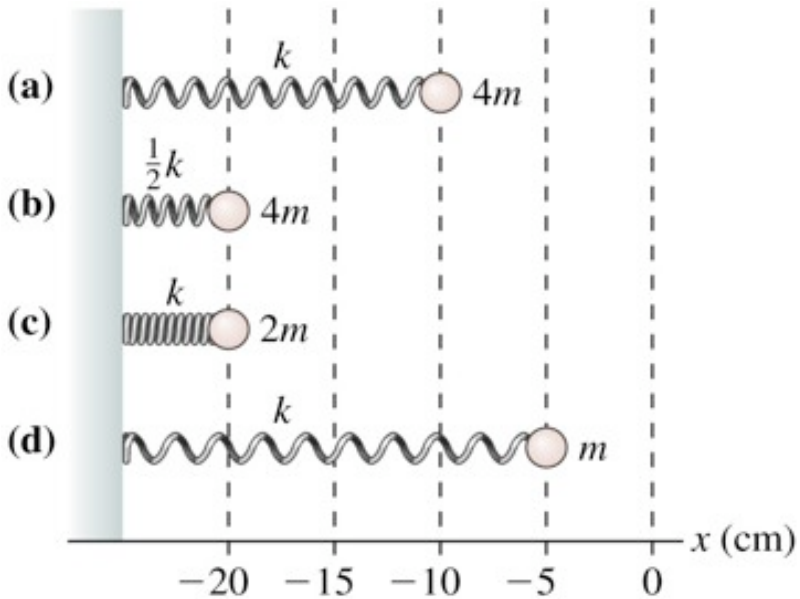
(b) fast

(c) correctly

12.6

Question:

Four springs have been compressed from their equilibrium position at x = 0 cm. When released, they will start to oscillate. Rank in order, from highest to lowest, the maximum speeds of the oscillations.



(A) $c > b > a > d$

(B) $c > b > a = d$

(C) $a = d > b > c$

(D) $d > a > b > c$

(E) $b > c > a = d$