

AP Physics 2

Quiz A: Electrostatics, Form: A

Name: _____

Date: _____

Period: _____

Authentication Code: _____

Section 1. Multiple Choice

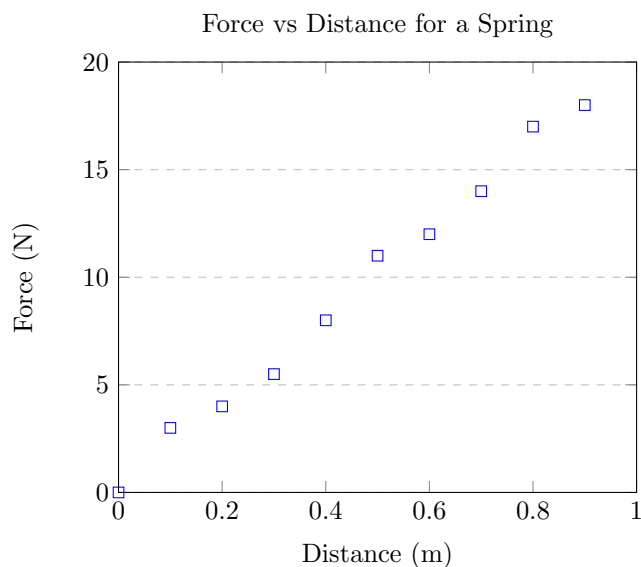
Choose the best answer to each question.

1. The force exerted by a spring is given by $F_s = -kx$. What is the best explanation of the negative sign?
 - (a) The force of a spring is always in the negative direction.
 - (b) A spring's force is always directed downward.
 - (c) The force of a spring is always opposite the direction it has been deformed.
 - (d) A spring's force is always less than the force pulling on it.
2. A spring is stretched a distance of 0.1 meters from its equilibrium position. What kind of energy does the spring have?
 - (a) Elastic Potential Energy
 - (b) Gravitational Potential Energy
 - (c) Kinetic Energy
 - (d) Vernal Energy
3. Which of the following could make a pendulum's period decrease?
 - (a) Decreasing the mass of the bob.
 - (b) Increasing the maximum angle of the swing.
 - (c) Decreasing the length of the pendulum.
 - (d) Decreasing the gravity acting on the pendulum.
4. As a pendulum swings from one side of its path to the center, energy transforms -
 - (a) from gravitational potential energy to kinetic energy.
 - (b) from gravitational potential energy to elastic potential energy.
 - (c) from elastic potential energy to kinetic energy.
 - (d) from kinetic energy to gravitational potential energy.
5. A spring is stretched a distance of 3 cm and has an elastic potential energy of 2 J. If the spring were to be stretched 9 cm, what would the elastic potential energy of the spring be?
 - (a) 2 J
 - (b) 6 J
 - (c) 18 J
 - (d) 36 J
6. Which of the following springs would be hardest to stretch or compress?
 - (a) A spring of spring constant $k = 10 \frac{N}{m}$
 - (b) A spring of spring constant $k = 100 \frac{N}{m}$
 - (c) A spring of spring constant $k = 1000 \frac{N}{m}$
 - (d) A spring of spring constant $k = 10000 \frac{N}{m}$

7. Which is the best explanation of why old-fashioned clocks have pendulums?
- (a) The time it takes a pendulum to swing only depends on length and gravity.
 - (b) The mass of a pendulum controls its period.
 - (c) They can be used to hypnotize people while looking at the clock.
 - (d) Pendulums look pretty.
8. If the length of a pendulum is doubled, its period will -
- (a) remain the same
 - (b) increase by a factor of $\sqrt{2}$.
 - (c) increase by a factor of 2.
 - (d) Increase by a factor of 4.

Section 2. Free Response

9. A student collects data from a spring, and finds the following:



- (a) Draw a best fit line through the data and find the slope of the line.
 - (b) What is the Spring Constant of the Spring?
10. An astronaut wants to make a pendulum with a period of 1 second. What would its length need to be on Mars where gravity is 3.8 m/s^2 ?

Answer Key for Exam A

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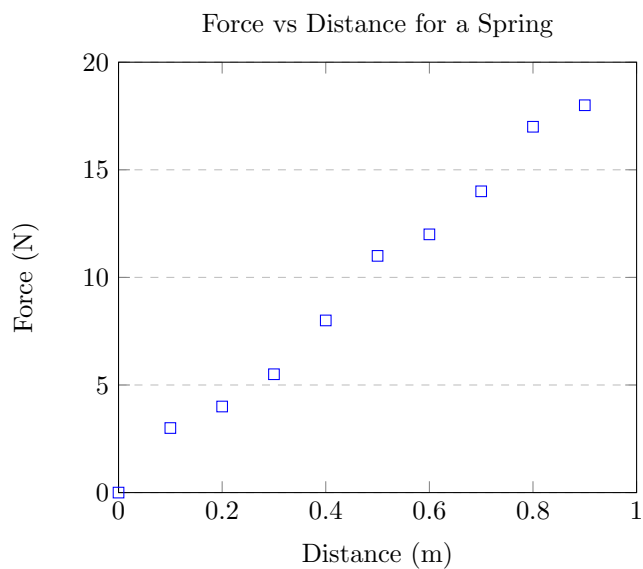
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