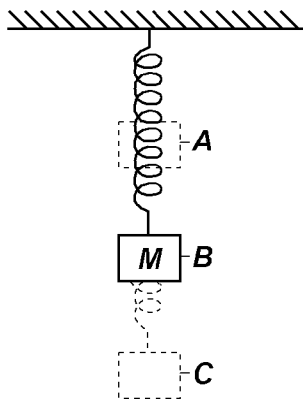Name: _____
Regents Physics - Springs HW #1


Questions 1 through 3 refer to the following:

A mass, M, is hung from a spring and reaches equilibrium at position B. The mass is then raised to position A and released. The mass oscillates between positions A and C. [*Neglect friction.*]


___ 1)   At which position in the diagram, A, B, or C, is mass M located when the kinetic energy of the system is at a maximum? [*Explain your choice.*]

___ 2)   At which position in the diagram, A, B, or C, is mass M located when the gravitational potential energy of the system is at a maximum? [*Explain your choice.*]

___ 3)   At which position in the diagram, A, B, or C, is mass M located when the elastic potential energy of the system is at a maximum? [*Explain your choice.*]

___ 4)   As a spring is stretched, its elastic potential energy

A) remains the same   B) decreases   C) increases

___ 5)   When a 1.53-kilogram mass is placed on a spring with a spring constant of 30.0 newtons per meter, the spring is compressed 0.500 meter. How much energy is stored in the spring?

___ 6)   A 5-newton force causes a spring to stretch 0.2 meter. What is the potential energy stored in the stretched spring?

___ 7) Which graph *best* represents the elastic potential energy stored in a spring (PE_s) as a function of its elongation (x)?

A)

B)

C)

D)
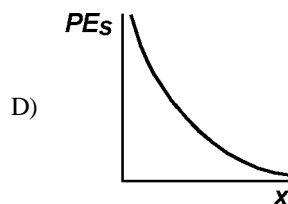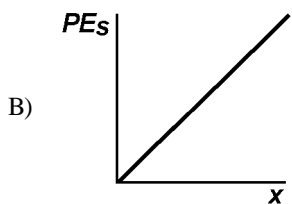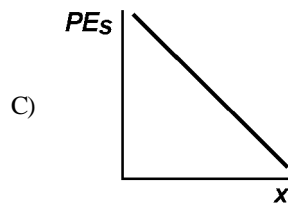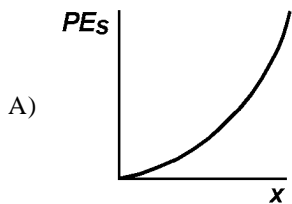
___ 8) The graph below shows the relationship between the elongation of a spring and the force applied to the spring causing it to stretch.

Elongation vs. Applied Force
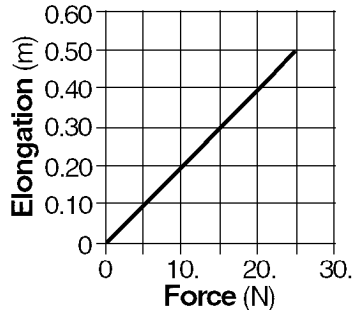
What is the spring constant for this spring?

A) 0.020 N/m   B) 50. N/m   C) 2.0 N/m   D) 25 N/m

___ 9) A vertical spring 0.100 meter long is elongated to a length of 0.119 meter when a 1.00 kilogram mass is attached to the bottom of the spring. The spring constant of this spring is

A) 520 N/m   B) 9.8 N/m   C) 98 N/m   D) 82 N/m