QUIZ - STRESS, STRAIN, AND HOOKE'S LAW

Name_____

Period_____

1) Stress is   1) _____
    A) the strain per unit length.   B) the same as force.
    C) applied force per cross-sectional area.   D) the ratio of the change in length.

2) Strain is   2) _____
    A) the stress per unit area.
    B) the ratio of the change in length to the original length.
    C) the ratio of stress to elastic modulus.
    D) the applied force per unit area.

3) A mass is hung from identical wires made of aluminum, brass, copper, and steel. Which wire   3) _____
will stretch the least?
    A) brass $(100 \times 10^9$ Pa)
    B) copper $(130 \times 10^9$ Pa)
    C) aluminum $(70 \times 10^9$ Pa)
    D) steel $(200 \times 10^9$ Pa)
    E) all the same

4) An aluminum wire 3.0 m in length and 4.0 mm in diameter supports a 10.0-kg mass.   4) _____
What is the stress in the wire? (The Young's modulus for aluminum is 7.0×10^{10} N/m^2)

5) An aluminum wire 3.0 m in length and 4.0 mm in diameter supports a 10.0-kg mass.   5) _____
What is the elongation of the wire? (The Young's modulus for a n aluminum is 7.0×10^{10} N/m^2)

6) Below is a table of information from a student experiment. Use this information to create a graph that will help you determine the spring constant (k) of the spring used in the experiment. To help you do this, you should create a graph that involves force and displacement. Be sure to indicate the line of best fit on the graph.

Data Table: *Response of a Spring to Added Mass*

Mass(g)	Position (cm)
0	5
20	25
50	42
80	63
100	72
115	90

Force (N) vs. Displacement (m)
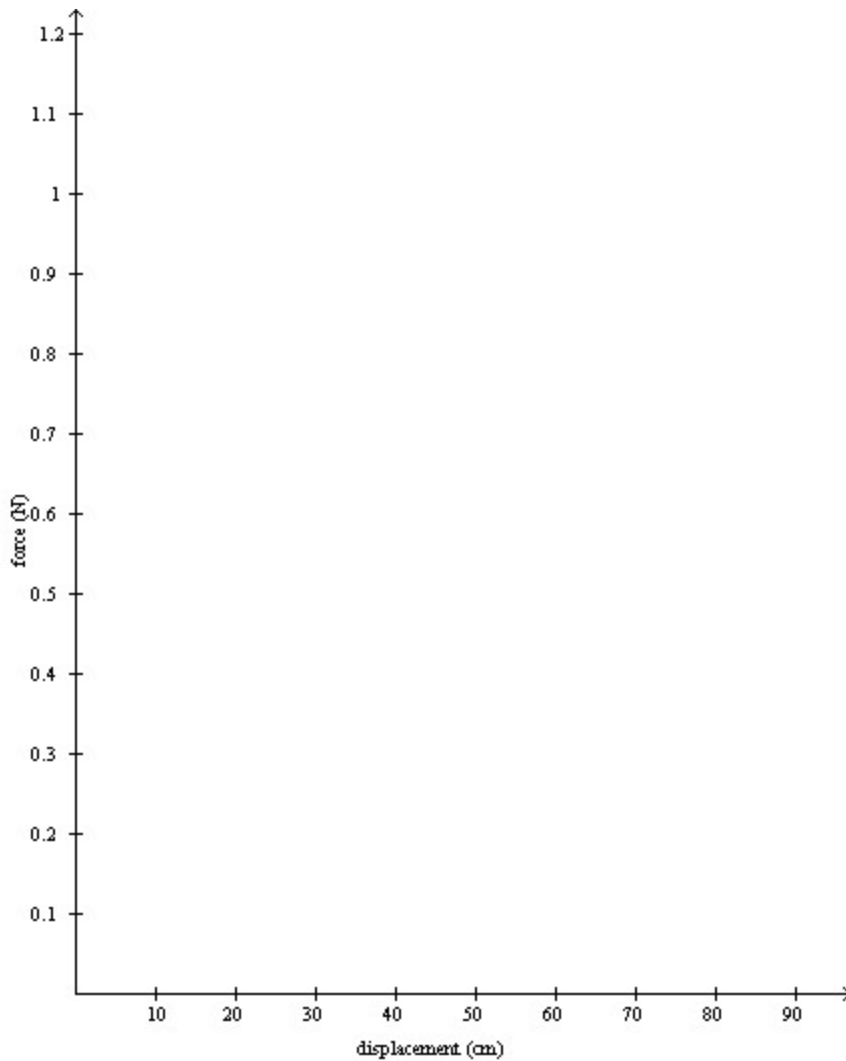
1) C

2) B

3) D

4) 7.8×10^7 N/m^2

5) 33.4 mm

6) k = .69 N/cm
   see graph for details