

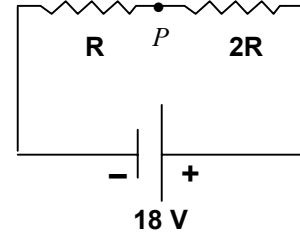
Physics 112
Quiz #12
October 8, 1999

Name: _____

IF YOU WANT A QUESTION GRADED OUT OF THREE POINTS (-1 [MINUS ONE] FOR WRONG ANSWER!!) WRITE "3" IN SPACE PROVIDED ON EACH QUESTION.

$$e = 1.60 \times 10^{-19} \text{ C}$$
$$k = 9 \times 10^9 \text{ N m}^2/\text{C}^2$$

1. A resistor R and a resistor $2R$ are connected in series to an 18-V battery as shown in the diagram. If the potential at the negative terminal of the battery is 0 volts, what is the value of the potential at point P ?
- A. 0 V
 - B. 3 V
 - C. 6 V
 - D. 9 V
 - E. 12 V
 - F. 15 V
 - G. There is not enough information to answer this.



Grade out of 3? Write "3" here: _____

2. A charge q and a charge $2q$ flow through the same battery from the negative terminal to the positive terminal. Which of these statements is true about this process?
- A. Both charges experience the same increase in potential, and both gain the same amount of potential energy.
 - B. Both charges experience the same increase in potential, but the charge q gains more potential energy.
 - C. Both charges experience the same increase in potential, but the charge $2q$ gains more potential energy.
 - D. The charge q experiences a larger increase in potential, but both gain the same amount of potential energy.
 - E. The charge q experiences a larger increase in potential, but the $2q$ charge gains more potential energy.
 - F. The charge q experiences a larger increase in potential, **and** gains a larger amount of potential energy.
 - G. The charge $2q$ experiences a larger increase in potential, but both gain the same amount of potential energy.
 - H. The charge $2q$ experiences a larger increase in potential, but the q charge gains more potential energy.
 - I. The charge $2q$ experiences a larger increase in potential, **and** gains a larger amount of potential energy.

Grade out of 3? Write "3" here: _____

3. A 5-C charge is fixed at the origin. A 2-C charge is held 3 m from the origin, and then released. Later, a 1-C charge is held 2 m from the origin, and it is released. *All three charged particles have the same mass.* Which of these statements is true, in comparing the 2-C and the 1-C charges: **[CIRCLE THE TWO CORRECT STATEMENTS; HALF CREDIT FOR EACH.]**
- A. The 2-C charge experiences the larger initial force.
 - B. The 1-C charge experiences the larger initial force.
 - C. Both the 1-C and the 2-C charges experience the same initial force.
 - D. The 2-C charge will eventually attain the fastest speed (i.e., when it is very far from the origin.)
 - E. The 1-C charge will eventually attain the fastest speed (i.e., when it is very far from the origin.)
 - F. Both the 1-C and the 2-C charges will eventually attain the same speed.

4. An electron is located at the origin. What is the force exerted **on this electron** by a +3-C charge that is located on the positive x axis, 40 centimeters away from the origin? Give magnitude and direction (*toward positive x , toward negative x , toward positive y , or toward negative y*) of the force. (*No partial credit. Your answer must be within 10% of the correct answer to receive credit. Units missing or incorrect: -1 point.*)

Answer: magnitude [2 pts] _____; direction [0.5 pt]: _____