

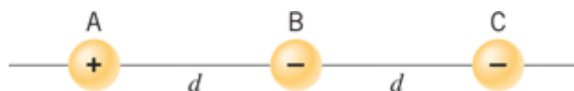
# Physics HW on Electric Forces

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Due Friday December 1<sup>st</sup>, 2017

1. Three point charges have equal magnitudes and are located on the same line.

The separation  $d$  between A and B is the same as the separation between B and C. One of the charges is positive and two are negative, as the drawing shows. Consider the net electrostatic force that each charge experiences due to the other two charges. Rank the net forces in descending order (greatest first) according to magnitude.



- (a) A, B, C
- (b) B, C, A
- (c) A, C, B
- (d) C, A, B
- (e) B, A, C

Explain your answer.

2. An object has a charge of  $-2.0\mu\text{C}$ . How many electrons must be removed so that the charge becomes  $+3.0\mu\text{C}$ ?
3. In a vacuum, two particles have charges of  $q_1$  and  $q_2$ , where  $q_1 = +3.5\mu\text{C}$ . They are separated by a distance of 0.26 m, and particle 1 experiences an attractive force of 3.4N. What is  $q_2$  (magnitude and sign)?
4. Two tiny conducting spheres are identical and carry charges of  $-20.0\mu\text{C}$  and  $+50.0\mu\text{C}$ . They are separated by a distance of 2.50 cm.
- (a) What is the magnitude of the force that each sphere experiences, and is the force attractive or repulsive?
  - (b) The spheres are brought into contact and then separated to a distance of 2.50 cm. Determine the magnitude of the force that each sphere now experiences, and state whether the force is attractive or repulsive.