Physics 23 Problem Set 5

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Due Monday, October 24

Please make your work neat, clear, and easy to follow. It is hard to grade sloppy work accurately. Generally, make a clear diagram, and label quantities. Derive symbolic answers, and then plug in numbers after a symbolic answer is available.
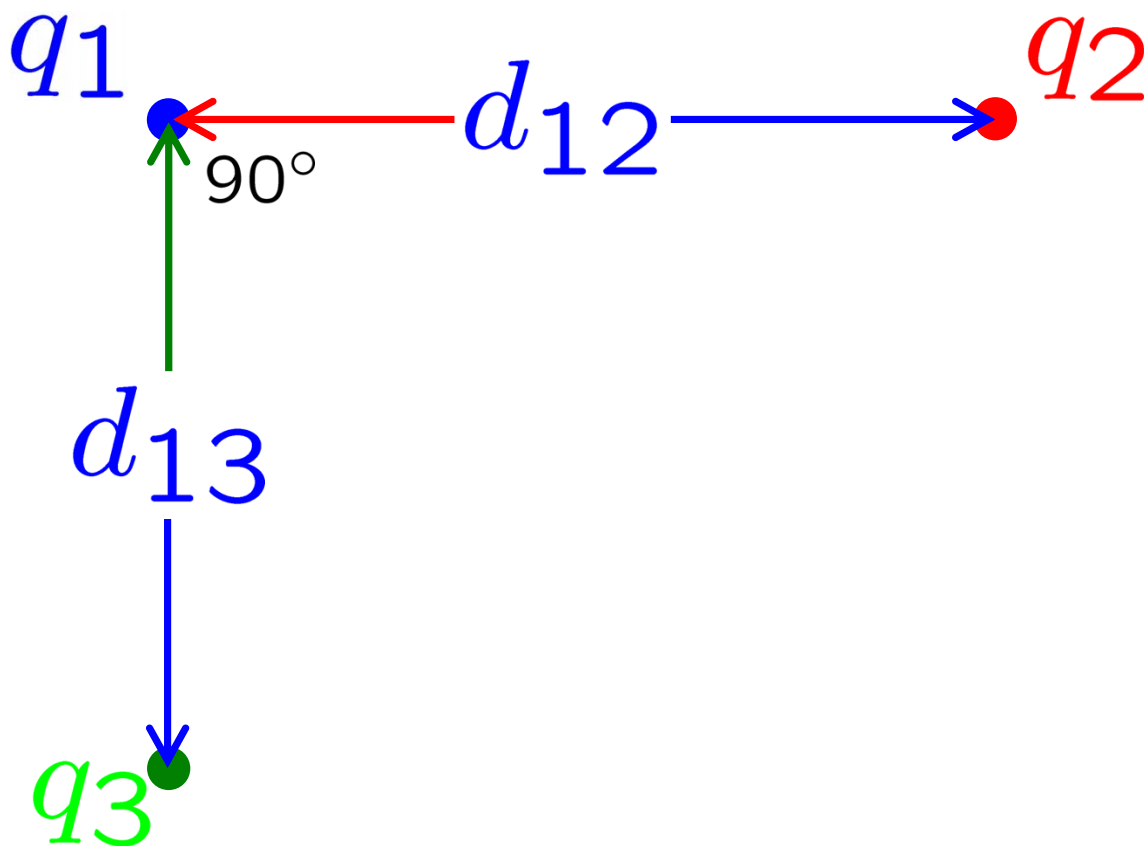

Figure 1: For use in Problem 1.

1. Three charges, $q_1 = -2$ esu, $q_2 = -4$ esu, and $q_3 = 8$ esu are located at the corners of a right triangle, which has sides $d_{13} = 4$ cm and $d_{12} = 4\sqrt{3}$ cm, as shown in Fig. 1.

   (a) Evaluate and draw the net electrostatic force on each charge.
   (b) Evaluate the electrical potential energy U of these charges.

2. Purcell 1.3. Also, work the problem in gCGS units, starting by converting distances to centimeters, and using a mass of $m = 300$ gm and an acceleration of gravity $g = 980$ cm/s^2.

3. Purcell 1.7.

4. Purcell 1.8.