Practice with the **Electric Field 1**          Name:_____Block:_____

Draw electric field line diagrams for the following charge distributions.  (Remember, if the charge is twice as much, it should have twice the number of field lines coming from it or going toward it.)

| | | |
|---|---|---|
| +q | +2q | +3q |
| -q | -2q | -3q |

| | |
|---|---|
| +2q          +2q | -2q          -2q |

| |
|---|
| +2q                    -2q |

Given the description of the electric field, _draw and label_ the **electric field vector** in the center of the box. Also determine and _draw and label_ the **electric force vector** on the following charges placed within the electric fields.

| | |
|---|---|
| An Electric Field, $\vec{E}$, points right:<br><br><br><br>+Q | An Electric Field, $\vec{E}$, points right:<br><br><br><br>-Q |
| An Electric Field, $\vec{E}$, points up:<br><br><br><br>+Q | An Electric Field, $\vec{E}$, points up:<br><br><br><br>-Q |
| An Electric Field, $\vec{E}$, points left:<br><br><br><br>+2Q | An Electric Field, $\vec{E}$, points left:<br><br><br><br>-2Q |
| An Electric Field, $\vec{E}$, points down:<br><br><br><br>+3Q | An Electric Field, $\vec{E}$, points down:<br><br><br><br>-3Q |

Practice with the **Electric Field 2**          Name:_____Block:_____

1. Find the magnitude *and* direction of the electric force on a +14 nC charge placed in a rightward pointing electric field of 25,000 N/C.

2. Find the magnitude *and* direction of the electric force on a -5.0 µC charge placed in a rightward pointing electric field of 16,000 N/C.

3. Find the magnitude *and* direction of the electric field that produces a 1.0 N leftward force on a +12 µC charge.

4. Find the magnitude *and* direction of the electric field that produces a 2.0 N leftward force on a -53 nC charge.

5. Find the magnitude *and* sign of the charge that experiences a 0.50 N rightward force in a rightward-directed electric field of 250,000 N/C.

6. Find the magnitude *and* sign of the charge that experiences a 0.20 N leftward force in a rightward-directed electric field of 125,000 N/C.

## 20.4 The Concept of the Electric Field

20. This is a uniform gravitational field near the earth's surface. Rank in order, from largest to smallest, the accelerations $a_1$ to $a_3$ of a small mass at points 1, 2, and 3.
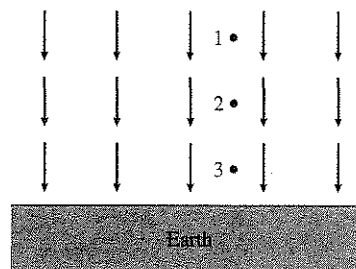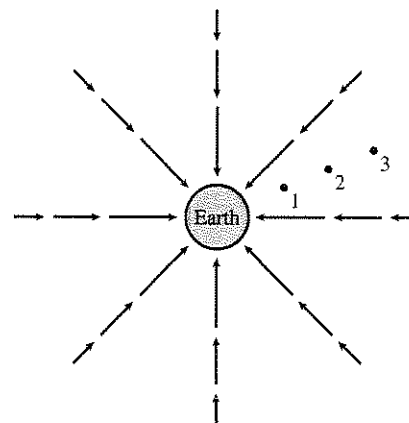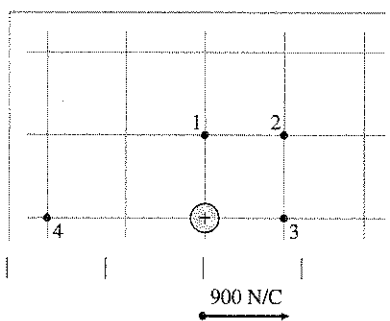
    Order:

    Explanation:

21. This is the gravitational field of the earth. Rank in order, from largest to smallest, the accelerations $a_1$ to $a_3$ of a small mass at points 1, 2, and 3.

    Order:

    Explanation:

22. At points 1 to 4, draw an electric field vector with the proper direction and whose length is proportional to the electric field strength at that point.

23. a. The electric field of a point charge is shown at *one* point in space. Can you tell if the charge is + or –? If not, why not?

    b. Here the electric field of a point charge is shown at two positions in space. Now can you tell if the charge is + or –? Explain.
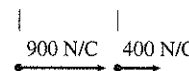
    c. Can you determine the location of the charge? If so, draw it on the figure. If not, why not?