$\qquad$ Name $\qquad$

1. Find the magnitude (size) of the E-field 1 mm from the nucleus of a uranium atom (atomic \# 92).

2. The electric force on a point charge of $5 \mathrm{E}-9 \mathrm{C}$ at some point is $3.8 \mathrm{E}-3 \mathrm{~N}$. What is the magnitude (size) of the E-field at this location?

3. The magnitude of the E-field at a certain location is $500 \mathrm{~N} / \mathrm{C}$ and the field is directed east to west. Find the magnitude and direction of the force acting on a proton placed at this point.

4. Find the magnitude and direction of the E-field at a distance 10 cm from an electron.

5. The E-field at a distance of 0.8 meters from a certain charge is found to have a magnitude of $200 \mathrm{~N} / \mathrm{C}$. What is the magnitude of the charge which created the E-field?

6. What is the magnitude of the E-field that will balance the weight of an electron?

7. Two charges, $q_{1}$ and $q_{2}$, lie 1 meter apart along the $x$ axis as in the figure below. How far from $q_{1}$ should $\mathrm{q}_{3}$, having a charge of $-1 \mu \mathrm{C}$, be placed so that the resultant electric force on $\mathrm{q}_{3}$ is zero?
$\mathrm{q}_{1}=+15 \mu \mathrm{C} \quad \mathrm{q}_{2}=+6 \mu \mathrm{C}$

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q_{3}=-1 \mu C
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8. What is the magnitude (size) and direction of the E-field 3 nanometers ( nm ) away from an Oxygen ( +8 e ; mass 16 amu ) nucleus? Draw the E-Field.

9. What is the magnitude (size) and direction of the force placed on a electron that is 3 nm to the right of the Oxygen nucleus in problem 8 above?

10. How large of a an electric field would be needed to balance the WEIGHT of the Oxygen nucleus?

11. The E-field at a distance of 8 nanometers from a certain charge is found to have a magnitude of 5.0 E 12 N/C. What is the magnitude of the charge which created the E-field?

12. Draw the E-field for each of the following charges:


