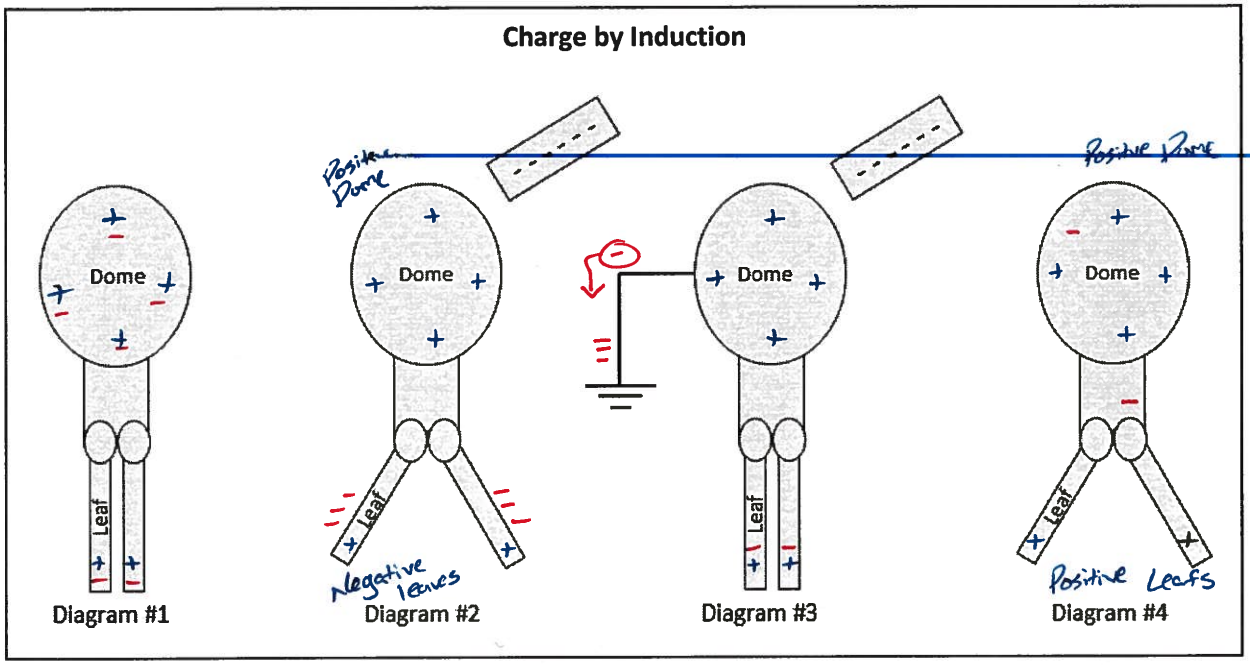
KEY

First Name:_____ Last Name:_____

L05 – FQ – Coulomb's Law Examined Graphically

Use the following information to answer Q1:



Q1: In Diagram #2, the dome becomes __*i*__ charged due to the movement of __*ii*__ charges.

	i.	*ii.*
A.	positively	positive
B.	Positively	negative
C.	negatively	positive
D.	negatively	negative

Q2: In Diagram #3, due to the presence of the grounding wire, the number of electrons __*i*__ and the number of protons __*ii*__ in the electroscope.

	i.	*ii.*
A.	Increases	Stays the same
B.	Decreases	Stays the same
C.	Stays the same	Increases
D.	Stays the same	Decreases

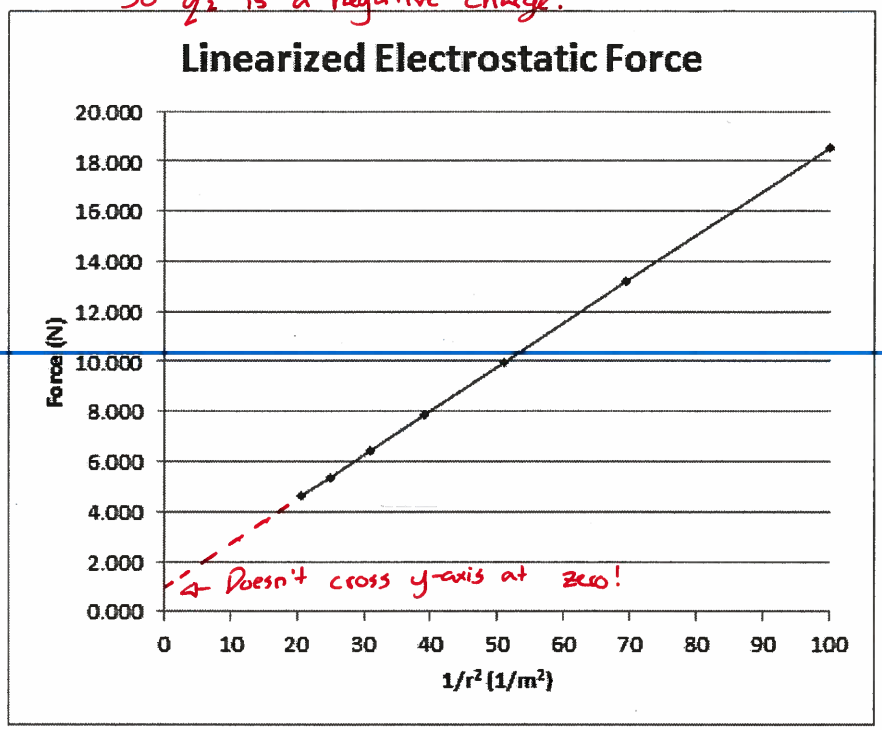
KEY

Use the following information to answer Q3:

The electrostatic attraction between a +3.00μC charge and an unknown charge is graphed below.

So q_2 is a negative charge.

r	1/r^2	F
0.100	100.000	18.531
0.120	69.444	13.174
0.140	51.020	9.944
0.160	39.063	7.848
0.180	30.864	6.411
0.200	25.000	5.383
0.220	20.661	4.622



Q3: The unknown charge is

a. +6.50μC
b. -6.50μC
c. +6.87μC
d. -6.87μC

$F = (kq_1q_2)\frac{1}{r^2} + 0$

$y = (m)x + b$

It should cross at zero, but it may not. Calculate actual slope!

So slope $= \frac{\text{rise}}{\text{run}}$ and slope $= kq_1q_2$

$m = \frac{18.531 - 4.622}{100 - 20.661} = 0.175311007197$

$m = kq_1q_2$

$0.175311007197 = (8.99\times10^{9})(3\times10^{-6})q_2$

$q_2 = 6.50\times10^{-6}\,C$

Force of attraction?

$q = -6.50\times10^{-6}\,C$

MARKING:

Beginning	0.0 – 2.5
Progressing	3.0 – 4.0
Competent	4.5 – 5.5
Exemplary	6.0