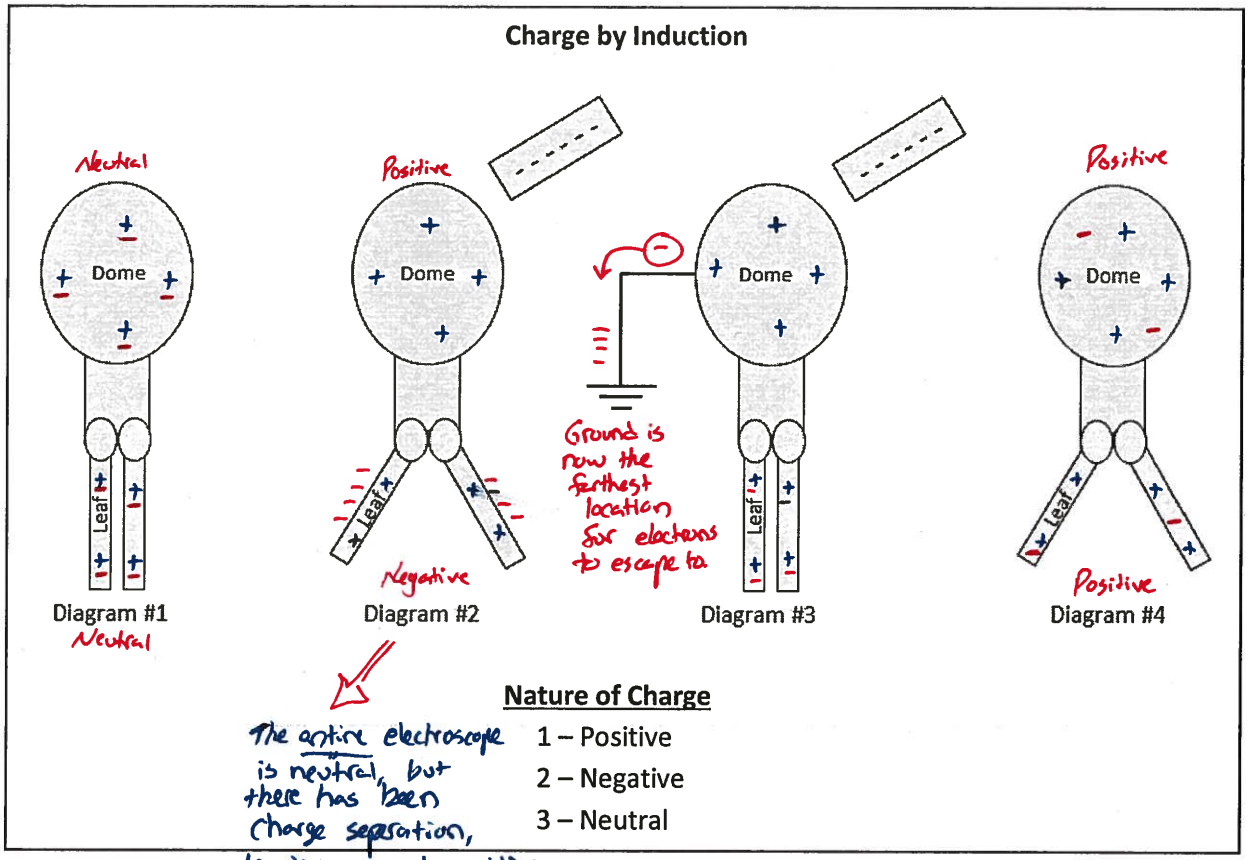
KEY

First Name:_____ Last Name:_____

L04 – FQ – Coulomb's Law in 2-D

Use the following information to answer Q1:



Q1: Match the numbers representing *Nature of Charge* with the regions given below.

Nature of Charge:	1	2	1	1
Region:	Dome in Diagram #2	Leaves in Diagram #2	Dome in Diagram #4	Leaves in Diagram #4

*(Record your **four digit** answer in the Numerical Response boxes below)*

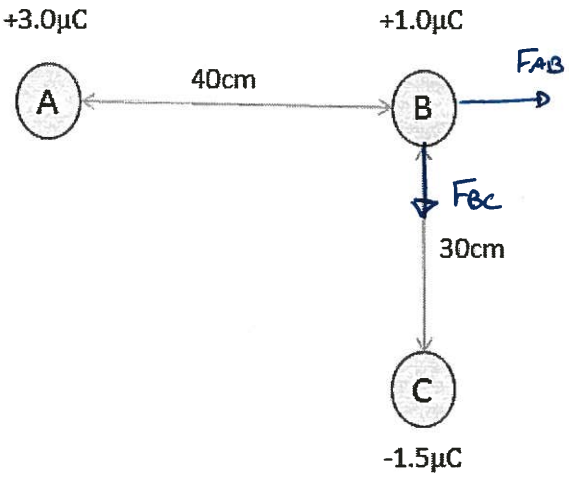
1	2	1	1

KEY

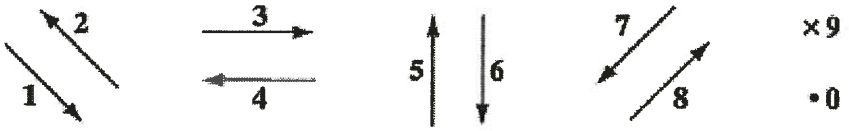
Use the following information to answer Q2-Q6:

Three Point Charges

Three point charges are arranged at a right angle according to the diagram below.



Directions



Q2: Use the vector directions above to fill in the blanks below.

Direction:	3	6	1
Description:	**Direction of Force acting on Charge B due to Charge A**	**Direction of Force acting on Charge B due to Charge C**	**Direction of Net Force acting on Charge B**

*(Record your **three-digit** answer in the Numerical Response boxes below)*

3	6	1	

KEY

Q3: The magnitude of the electrostatic force acting between *Charge A* and *Charge B* is ***a.bc*** x 10^{-d} C, where ***a, b, c,*** and ***d*** are ___, ___, ___, and ___.

*(Record your **four-digit** answer in the Numerical Response boxes below)*

1	6	9	1

$F = \frac{(8.99\times10^{9})(3\times10^{-6})(1\times10^{-6})}{(0.4)^2} = \frac{0.02697}{0.16} = 0.1685625\ N$

$F \approx 1.69\times10^{-1}\ C$

Q4: The magnitude of the electrostatic force acting between *Charge B* and *Charge C* is ***a.bc*** x 10^{-d} C, where ***a, b, c,*** and ***d*** are ___, ___, ___, and ___.

*(Record your **four-digit** answer in the Numerical Response boxes below)*

1	5	0	1

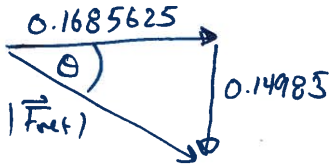
$F = \frac{(8.99\times10^{9})(1\times10^{-6})(1.5\times10^{-6})}{(0.3)^2} = \frac{0.013485}{0.09} = 0.14983\overline{3}\ N$

$F \approx 1.50\times10^{-1}\ C$

Q5: The magnitude of the net force acting on *Charge B* is ***a.bc*** x 10^{-d} C, where ***a, b, c,*** and ***d*** are ___, ___, ___, and ___.

*(Record your **four-digit** answer in the Numerical Response boxes below)*

2	2	6	1



$a^2+b^2=c^2$

$|\vec{F}_{net}| = 0.225529031799$

$|\vec{F}_{net}| \approx 2.26\times10^{-1}\ N$

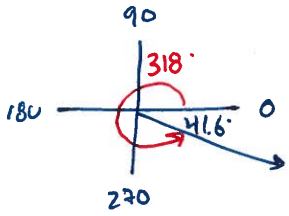
Q6: In direction of the net force acting on *Charge B*, in polar coordinates, is _____ degrees.

*(Record your **three-digit** answer in the Numerical Response boxes below)*

3	1	8	

$\tan\theta = \frac{0.14983\overline{3}}{0.1685625}$

$\theta = 41.6°$



MARKING:

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