

St John Baptist De La Salle Catholic School, Addis Ababa

Homework 4

2nd Quarter

Aaron GK

January 16, 2023

Notes, and use of other aids is allowed. Read all directions carefully and write your answers in the space provided. To receive full credit, you must show all of your work. **Cheating or indications of cheating and similar answers will be punished accordingly.**

Information

- The homework is due on **Monday, December 19th**.
- You should Work on it **individually** and consult me if you have any questions. As I have reiterated multiple times, cheating will have a serious consequence.
- For purposes of neatness and simplicity of grading, you should do the homework on an **A-4 paper**.

Questions

1. Define electric field and factors affecting a field that emerges from a source charge.
2. Discuss the differences between a source charge and a test charge.
3. If there are two charges placed on the x-axis, a $-2\mu\text{C}$ charge at $x = 3\text{nm}$ and a $+40\mu\text{C}$ charge at $x = -2\text{nm}$, compute the following:
 - Calculate the electrostatic force between the two charges.
 - If there is a charge of $+1\text{nC}$ placed at the position $y = 1.0\text{a}^0$, find the net force and electric field at that point.
4. Discuss the superposition principle and its applications.
5. What is the electric field of the nucleus of a Hydrogen ${}^1_1\text{H}$ atom 1m away from the nucleus. Compare this to the acceleration due to gravity by the nucleus.