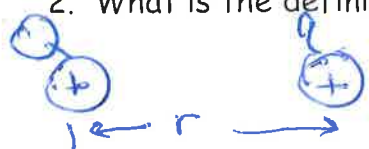


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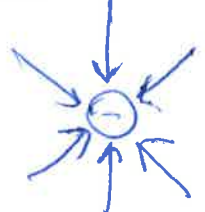
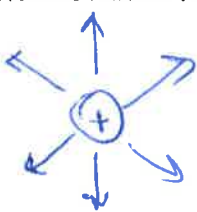
Notes - 18.4 Electric Field

1. What is a field? A field is a way to map the force on a small positive test charge.

2. What is the definition and equation for electric field in terms of force?


$$F = \frac{kQq}{r^2} \quad E = \frac{F}{q} = \frac{kQ}{r^2} \quad \left[\frac{N}{C} \right]$$

3. What is the equation for electric field in terms of charge and distance from that charge?

$$E = \frac{kQ}{r^2} \quad F = qE$$


4. Calculate the strength and direction of the electric field E due to a point charge of 2.00 nC at a distance of 5.00 mm from the charge. Show your starting equation and your work.

$$E = \frac{kQ}{r^2} = \frac{(8.99 \times 10^9 \frac{Nm^2}{C^2})(2.00 \times 10^{-9} C)}{(5.00 \times 10^{-3} m)^2} = 7.19 \times 10^5 \frac{N}{C}$$

radially away from point charge

5. What force does the electric field of magnitude $7.20 \times 10^5 N/C$ exert on a point charge of $-0.250 \mu C$? Show your starting equation and your work.

$$F = qE = (0.250 \times 10^{-6} C)(7.20 \times 10^5 \frac{N}{C}) = 0.180 N$$

in the opposite direction of the electric field