

## Electrostatics Quest Review Sheet

Know charged particles are sources of electric fields and are subject to the forces of the electric fields from other charges

Calculate the force between charged objects

Solve for the charge on one or two objects given other variables

Calculate the force on a charged object in an electric field

Calculate and describe how the force on a test charge changes with a change in charge or location

Know static electric fields have as their source some arrangement of electric charges and draw the electric fields created by point charges

Draw electric fields for various arrangements of charges

Know the definition and function of conductors and insulators

Define and give examples of conductors and insulators

Explain how conduction works in a metal

Explain an induced charge and know the difference between conduction and induction

Explain how charge is transferred between objects

Know how static charges are affected by the shape of a conductor and external factors

Explain how charge is spread and concentrated in a conductor (rules for static charges)

Explain how an induced charge can be created in a neutral conductor

Know how electric potential relates to charges

Explain how electric potential is not the same as but can be used to calculate potential energy

Explain the effect of voltage on an electric field or a capacitor

Know how charge is stored in capacitors and combinations of capacitors

Describe the electric field within a capacitor

Draw and identify the difference between serial and parallel connections

Calculate total capacitance given a specific arrangement of capacitors

Know the proper units for capacitance, potential difference and charge

These equations will be given. Know how to use them.

$$V = \frac{W}{q} \quad \text{electron} = 1.6 \times 10^{-19} \text{ C}$$

$$C_T = C_1 + C_2 + C_3 \dots$$

$$\frac{1}{C_T} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} \dots$$

$$E = \frac{F}{q}$$

$$F = k \frac{q_1 q_2}{r^2}$$

$$k = 9.0 \times 10^9 \frac{\text{Nm}^2}{\text{C}^2}$$

$$C = \frac{Q}{V}$$