

ELECTROSTATICS CHART

	ELECTRICAL FORCES	ELECTRIC FIELDS	ELECTRIC POTENTIAL	ELECTRIC POTENTIAL ENERGY
UNITS	$N \left(\frac{kg \cdot m}{s^2} \right)$	$\frac{N}{C} = \frac{V}{m}$ $\left(\frac{kg \cdot m}{s^2 \cdot C} \right)$	$V = \frac{J}{C}$ $\left(\frac{kg \cdot m^2}{s^2 \cdot C} \right)$	J $\left(\frac{kg \cdot m^2}{s^2} \right)$
DOES CHARGE HAVE TO BE AT POINT OF INTEREST?	YES	NO	NO	YES
DOES THE QUANTITY SUPERPOSE?	YES	YES	YES	NO
SCALAR OR VECTOR	VECTOR	VECTOR	SCALAR	SCALAR
VARIABLE	\vec{F}	\vec{E}	V	U
FORMULA FOR POINT CHARGE	$\vec{F} = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2} \hat{r}$	$\vec{E} = \frac{1}{4\pi\epsilon_0} \frac{q}{r^2}$	$V = \frac{q}{4\pi\epsilon_0 r}$	$-\int_{\infty}^r \underline{F} \cdot d\ell$ $\left(\frac{q \cdot q_2}{4\pi\epsilon_0 r} \right)$
ELEVATION ANALOGY	—	POINTS DOWNHILL STEEPNESS = STRENGTH	ELEVATION	GRAVITATIONAL POTENTIAL ENERGY
VALUE IN CONDUCTOR	0	0	CONSTANT	—

RELATIONSHIPS:

$$\vec{F} = q \vec{E} \quad \vec{E} = -\vec{\nabla} V \quad V = -\int_{\infty}^r \underline{E} \cdot d\ell \quad \Delta U = q \Delta V$$

others exist.