Guide to:	Electric fields created by charges: point particles, lines, planes and volumes of charge.
Applications:	Fields created by elementary particles (electron, proton), ions; molecular bonds; mesoscale objects where charge was separated by contact/friction (triboelectricity); dust filtering; printer toner/ink. Understanding current flow in conductors, and charged particle deflection between plates.
Basic idea:	An abstraction based on Coulomb's law to define the property of particles participating in Coulomb attraction/repulsion. Gauss' law useful for symmetric charge distributions (line, plane, volume).
Derivations:	1) Electric dipoles: simplify exact Coulomb result for large-distance r^{-3} fall-off due to cancellation.
	2) Line of charge: sum over infinite line to get d^{-1} fall-off of the field a distance d away from the line.
	3) Plane of charge: get constant field as a function of distance from a large plate.
Equations:	Point charge: $\vec{E} = \frac{q}{4\pi\epsilon_0}\frac{\hat{r}}{r^2} = \frac{q}{4\pi\epsilon_0}\frac{\vec{r}}{r^3}$
	Line of charge with linear charge density: $E = \frac{\mu}{4\pi\epsilon_0\ d} = \frac{Q/L}{4\pi\epsilon_0\ d}$ away from the line for positive Q.
	Plane of charge, linear surface charge density: $E = \frac{\eta}{2\epsilon_0} = \frac{Q/A}{2\epsilon_0}$ away from the plate f. positive Q.

Problems: 17.32-67; 75-94.
Challenge: adding fields from multiple sources requires superposition. This is vector addition, even though the formula gives the magnitude of the field. Watch out! Use electric field line drawings to get the idea.