# Fields

- A **Field** is a physical quantity that has certain value at any point of physical space (x,y,z), and time, t. In other words, it's a function defined in physical space & time.

- A field can be vector or scalar, but there are also other types.

- Electric field **E**, and Newtonian gravity **g**, are examples of vector fields.

- Electric force acting on a charge q:

$$\vec{F}_{elect} = q\vec{E}$$

here electric field does not depend on the charge q itself, but depends on other charges in space.

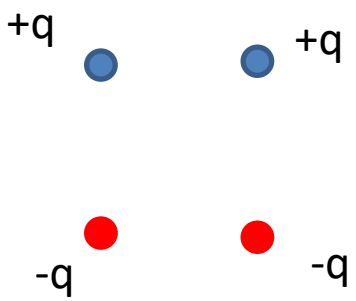
- Gravitational force:

$$\vec{F}_{grav} = m\vec{g}$$

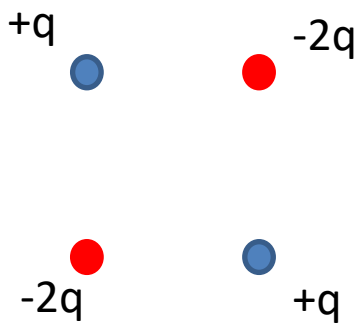
Mass m is the gravitational charge, g is the local gravity field. g is also an acceleration of a freely falling object, but of course it does not have to have the familiar value of 9.8 $m/s^2$, as on the surface of Earth.

**Problem 1.** For the following cases, sketch electric field lines:

a)



b)



c)