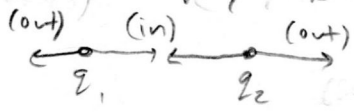
Quiz 1

- setup (3cm ≠ 6cm) ! Read carefully
- $|\vec{E}_{net}| \neq |\vec{E}_1| + |\vec{E}_2| + |\vec{E}_3|$ correct: $|\vec{E}_1 + \vec{E}_2 + \vec{E}_3| = |\vec{F}_{net}|$

  [Ex: $\vec{E}_1 = -\vec{E}_2, \vec{E}_3 = 0$] Fix: ① consider direction ② Write vector w/ magnitude & direction
- $\vec{F} = \vec{E}q$ (for point chage in constnt $\vec{E}$ field)
- $\vec{E}_q(P) = k\frac{|q|}{r^2}\hat{r}$ (magnitude, direction)

① draw line from chage q to point P
② $q>0 \Rightarrow$ arrow points away from q
$q<0 \Rightarrow$ arrow points towards q
[How to detemine direction]
③ $\hat{r}$ should simplify to $\hat{i}$ or $\hat{j}$ in this case

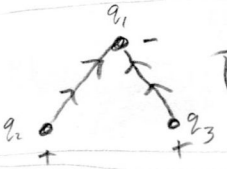
Ex: 

In: $\hat{r}_1 = -\hat{r}_2$
out: $\hat{r}_1 = \hat{r}_2$

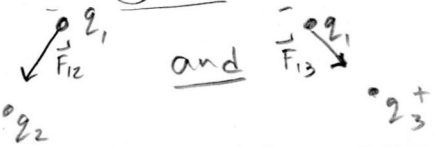
- ! Mind your sign

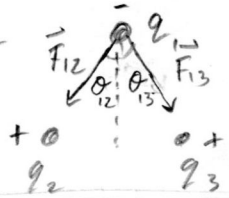
  Sign tells you directn
- Remember UNITS!
- Remember vectors have a vector sign! V is not a vecton, $\vec{V}$ is!
- $\vec{F}_{q_1 q_2} = \left(k\frac{|q_1 q_2|}{r^2}\right)(\hat{r})$ (magnitude, direction)

① consider one interactn at a time
② draw the force acting on the principal charge
③ repeat for all charges actg on the principal chage.

Note 

INCORRECT

① & ② 

③ add together ⇒ 

CORRECT

④ detemine $\hat{r}$ ⓐ $\hat{r} = \sin\theta\hat{i} + \cos\theta\hat{j}$ ⓑ $\hat{r} = \frac{\vec{r}}{\|\vec{r}\|}$

⑤ Write force vector w/ magnitude & direction for each interaction

⑥ Add like components $(\hat{i}, \hat{j}, \hat{k})$ to get $\vec{F}_{net}$