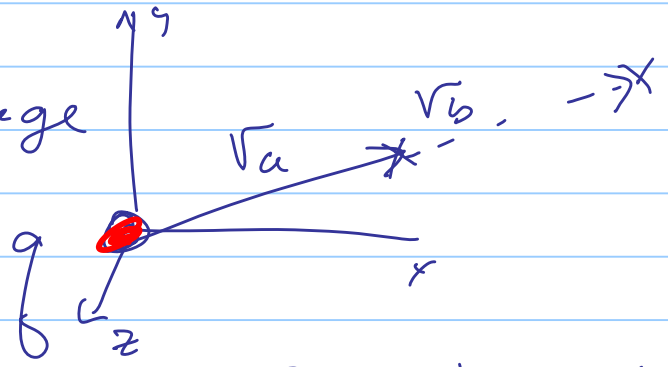
Questions 6

Note Title 1/23/2006

The difference in voltage between r_a & r_b is



$(r_b - r_a)$

(1) $\frac{q}{4\pi\epsilon_0}\left(\frac{1}{r_b} - \frac{1}{r_a}\right)$

(2) $\frac{q}{4\pi\epsilon_0}\left(\frac{1}{r_a} - \frac{1}{r_b}\right)$

(3) none

(4) don't know

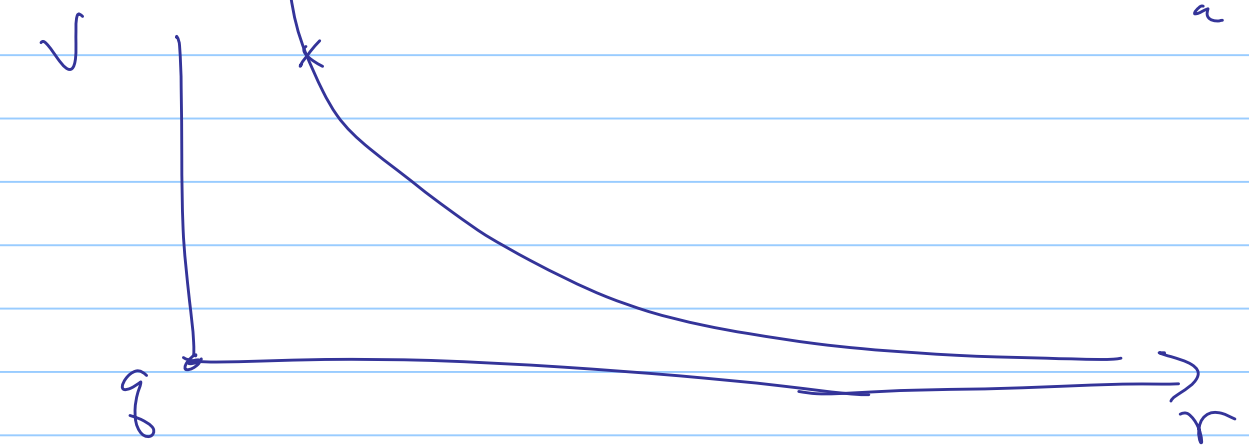
$\vec{R} = \vec{r} - \vec{r}'$

$$-\int \vec{E}\cdot d\vec{\ell} = -\int \frac{kq}{r^2}\hat{r}\cdot dr\,\hat{r} = -kq\int_a^b \frac{dr}{r^2}$$

$$\int \frac{dr}{r^2} = -\frac{1}{r}$$

$$\Delta V = V_b - V_a = kq\left(\frac{1}{r_b} - \frac{1}{r_a}\right)$$

define $V(\infty) \equiv 0$ $\quad b \to \infty$ $\quad V_a = \frac{kq}{r_a}$



How would you calculate the voltage from a uniformly charged sphere?

(1) $\Delta V = -\int \vec{E} \cdot d\vec{l}$ (2) $\Delta V = \int \frac{k\,dQ}{r}$

(3) something else (4) don't know