

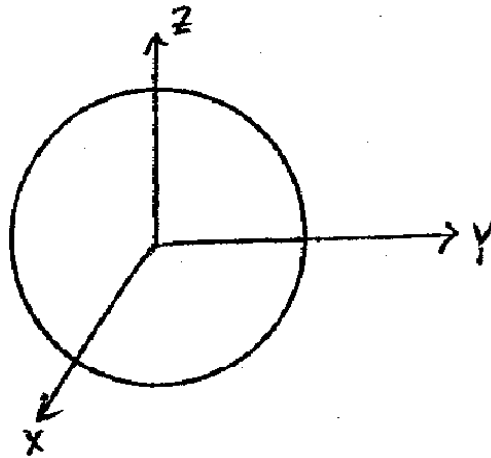
Physics 208 Practice Exam 1

February 08, 2007

- (25 points) A charge Q is uniformly spread along the y axis from $y = a$ to $y = b$. Find the electric field at $x = c, y = 0$.
- (25 points) Given the two positive charges, q_1 and q_2 and the negative charge $-q_3$, find the total electric force on the charge q_2 .
- (25 points) Given the \vec{E} field

$$\vec{E} = \alpha r^3 \vec{i}_r$$

with α a known constant, and r the distance from the origin, how much charge is there in a sphere of radius A located with the center at the origin as shown?



- (25 points) Suppose the Coulomb force is not the one that really exists in nature but instead was given by

$$\vec{F} = \gamma \frac{q_1 q_2}{r^4} \hat{r}$$

where γ is a known constant. For this force find the electric potential function, $V(x, y)$, for a charge Q located at $x = a, y = b$.