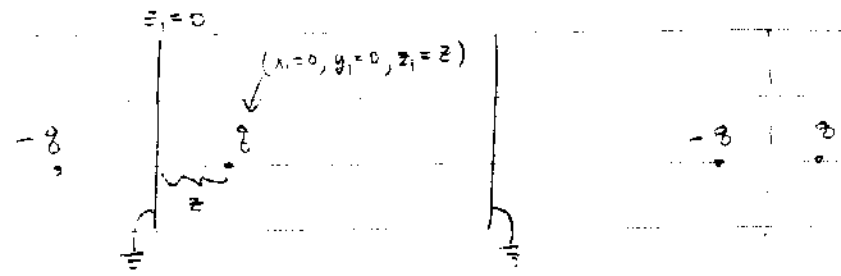


Official Solutions

Physics 721

Homework 6

1



Because of the images shown, we have

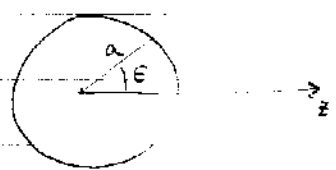
$$\Phi(\vec{r}) = \sum_{n=-\infty}^{\infty} \left(\frac{q}{\sqrt{x_1^2 + y_1^2 + (z_1 - f(n))^2}} + \frac{-q}{\sqrt{x_1^2 + y_1^2 + (z_1 - g(n))^2}} \right)$$

$$f(n) = z + 2nd$$

$$g(n) = -z + 2nd$$

2

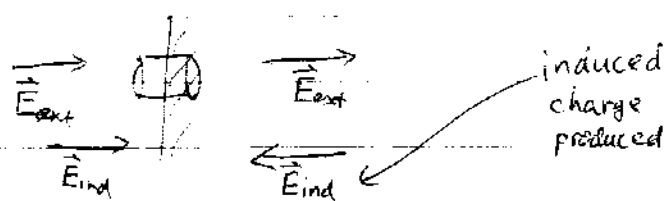
a) If the shell is uncharged,



$$\sigma(\theta) = 3\epsilon_0 \cos\theta \quad \text{according to Jackson eq (2.15)}$$

hence

$$d\vec{F}_e = \epsilon_0 \vec{E}_{ext} \sigma dA$$



$$(\vec{E}_{ind} + \vec{E}_{ext}) = 0$$

inside conductor

