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$r < 1$

$\vec{E} = 0$

$\vec{D} = 0$

$1 < r < 3$

$V_{cyl} = \pi h(r^2 - 1)$

$\int \vec{E}.d\vec{s} = \frac{Q_{enc}}{\varepsilon_0}$

$E(2\pi rh) = \frac{\rho_{vol}\pi h(r^2 - 1)}{\varepsilon_0}$

$E = \frac{\rho_{vol}(r^2 - 1)}{2r\varepsilon_0}$

$\vec{D} = \frac{\rho_{vol}(r^2 - 1)}{2r}\hat{r}$

$r > 3$

$V_{cyl} = \pi h(r^2 - 1)$

$\int \vec{E}.d\vec{s} = \frac{Q_{enc}}{\varepsilon_0}$

$E(2\pi rh) = \frac{\rho_{vol}\pi h(3^2 - 1)}{\varepsilon_0}$

$E = \frac{\rho_{vol}(3^2 - 1)}{2r\varepsilon_0}$

$\vec{D} = \frac{\rho_{vol}(3^2 - 1)}{2r}\hat{r}$