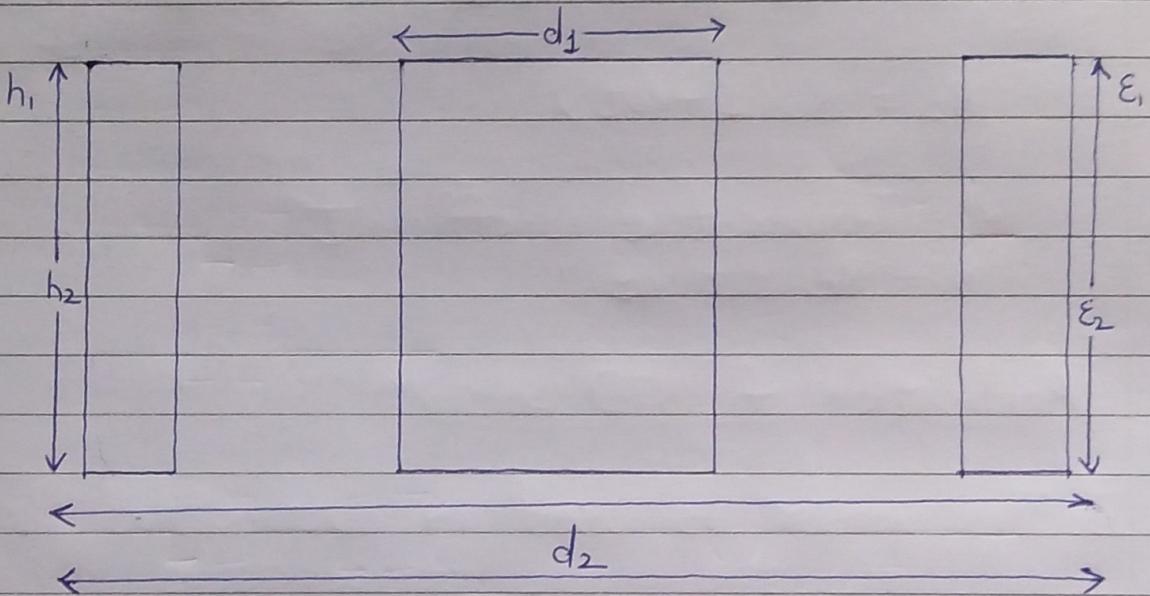


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\* Graded Activity 03 \*



$$C_x = \frac{2\pi(\epsilon_1 h_1 + \epsilon_2 h_2)}{\ln(d_2/d_1)}$$

$$\epsilon_1 = \epsilon_0 = 8.85 \text{ pF/m}$$

$$\epsilon_2 = 2.1 \times \epsilon_0 = 18.585 \text{ pF/m}$$

$$d_2 = 4 \text{ cm}$$

$$d_1 = 1 \text{ cm}$$

$$C_x = \frac{2\pi(8.85 h_1 + 18.585 h_2)}{\ln(4)}$$

$$= \frac{2\pi(8.85h_1 + 18.585h_2)}{1.386}$$

$$= 4.53 [8.85(0.5-h_2) + 18.585h_2]$$

$$= 40.09 [0.5 - h_2 + 2.1h_2]$$

$$C_x = 20.045 + 44.1h_2$$

$C_x$  is linear function of liquid  $h_2$  in cylinder

Height of cylinder = 500 cm = 0.5 m

$C_{min}$  when  $h_2 = 0$

$$\therefore C_{min} = 20.05 + 44.1(0) Pf$$

$$= \underline{\underline{20.05 Pf}}$$

$C_{max}$  when  $h_2 = 0.5 m$

$$\begin{aligned}\therefore C_{max} &= 20.05 + 44.1(0.5) Pf \\ &= \underline{\underline{42.1 Pf}}\end{aligned}$$