

63(24) : 63: CHECK

$$\phi = \frac{\rho(0)}{\epsilon_0} \left( \frac{\kappa^2 r^4 \cos^2(\kappa r)}{\kappa^4 r^4 \cos(\kappa r) + 5\kappa^3 r^3 \sin(\kappa r) - 3\kappa^2 r^2 \cos(\kappa r)} \right)$$

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Subsidiary resonance condition is:

$$x^2 \cos x + 5x \sin x - 3 \cos x = 0$$

$$\text{i.e. } (x^2 - 3) \cos x + 5x \sin x = 0$$

$$\text{i.e. } 5x \tan x = 3 - x^2$$

$$\tan x = \frac{3 - x^2}{5x} \quad \text{--- (2)}$$