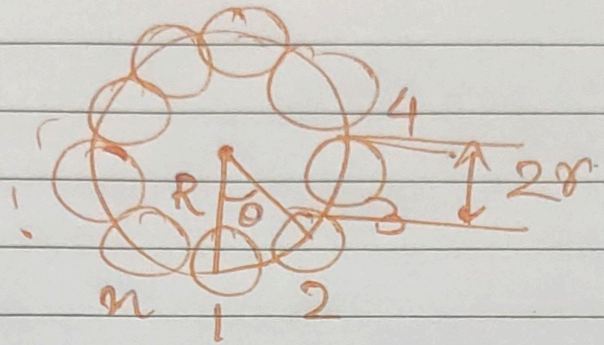


Power System Assignment

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Q2.2

Determine GMR of bundle of n similar conductors



$r' \rightarrow$ fictitious radius of conductor
Distance for conductor 1 & 2

$$D_{12} = 2R \sin \theta$$

Distance b/w conductor 1 & 3

$$D_{13} = 2R \sin 2\theta$$

Distance b/w 1st & i^{th} conductor
 $D_{1i} = 2R \sin(i-1)\theta$

Distance b/w 1 & n conductor

$$D_{1n} = 2R \sin \theta$$

$$= 2R \sin(t - (n-1)\theta)$$

$$x = (t - (n-1)\theta)$$

$$\sin(t-a) = \sin a$$

$$2R \sin(t - (n-1)\theta) = 2R \sin(n-1)\theta$$

$$D_{sy} = [(r')^n (2R)^n \sin \theta \sin 2\theta \sin 3\theta \dots \sin(n-1)\theta]^{1/n}$$

$$\Delta_{sy} = [r' 2R^{n-1} \sin \theta \sin 2\theta \dots \sin(n-1)\theta]^{1/n}$$

$$\Delta_s = [r' 2R^{n-1} \prod_{k=1}^{n-1} \sin(k\theta)]^{1/n}$$