$$V0 = \frac{Vm}{\pi}$$

$$V0 = \frac{1}{2 \cdot \pi} \int_0^{\pi} Vm \cdot \sin(\omega t)\, d(\omega t)$$

$$V0 = \frac{Vm}{2 \cdot \pi} \cdot [1 - \cos(\pi)]\ pri\ cemu\ je\ \pi = -\alpha$$

$$Vm = Vrms \cdot \sqrt{2}$$

$$Vrms = \sqrt{\tfrac{1}{2 \cdot \pi} \textstyle\int_0^{\pi} V0^2(\omega t) d(\omega t)} = \sqrt{\tfrac{1}{2 \cdot \pi} \textstyle\int_0^{\pi} [Vm \cdot \sin(\omega t)]^2\, d(\omega t)}$$

$$Vs(\omega t) = Vm \cdot \sin(\omega t)$$

$$V0, rms = \frac{Vm}{\sqrt{2}} \sqrt{\left(1 - \frac{\alpha}{\pi} + \frac{\sin(2 \cdot \alpha)}{2 \cdot \pi}\right)}$$

$$\alpha = \frac{V0, rms}{Vs, rms}$$

$$V0rms = \sqrt{P \cdot R}$$

$$i(\alpha) = \tfrac{Vm}{Z} \sin(\omega t - \theta) + Ae^{-\frac{\omega t}{\omega \tau}} pri\ čemu\ je\ A = \tfrac{\alpha}{\omega \tau}$$

$$Z = \sqrt{R^2 + (\omega L)^2}$$

$$\theta = \arctan\left(\frac{\omega L}{R}\right)$$

$$\tau = \frac{L}{R}, pomnozi\ se\ sa\ \omega\ za\ \omega \tau$$

$$I0 = \frac{1}{2 \cdot \pi} \int_{\alpha}^{\beta} \frac{Vm}{Z} \left[\sin(\omega t - \theta) - \sin(\alpha - \theta) \cdot e^{\frac{\alpha - \omega t}{\omega \tau}}\right] d(\omega t)\ pri\ čemu\ \frac{\alpha - \omega t}{\omega \tau} = -\frac{(\omega t - \alpha)}{\omega \tau};\ \alpha \le \omega t \le \beta$$

$$i(\omega t) = \frac{Vm}{Z} \cdot \left[\sin(\omega t - \theta) - \sin(\alpha - \theta) \cdot e^{\frac{\alpha - \beta}{\omega \tau}}\right], pri\ uslovu\ \alpha \le \omega t \le \beta;\ \omega t = \alpha\ ako\ se\ zada$$

$$i(\beta) = \frac{Vm}{Z} \cdot \left[\sin(\beta - \theta) - \sin(\alpha - \theta) \cdot e^{\frac{\alpha - \beta}{\omega \tau}}\right] = 0;$$

$$Irms = \sqrt{\left(\frac{1}{2 \cdot \pi} \cdot \int_{\alpha}^{\beta} \frac{Vm}{Z} \cdot \left[\sin(\omega t - \theta) - \sin(\alpha - \theta)\, e^{\frac{\alpha - \omega t}{\omega \tau}}\right]^2 d(\omega t)\right)}$$

$$Iscr, avg = \tfrac{1}{2 \cdot \pi} \textstyle\int_{\alpha}^{\beta} \tfrac{Vm \sin(\omega t)}{R}\, d(\omega t) = \tfrac{Vm}{2 \cdot \pi \cdot R} (1 + \cos(\alpha))$$

$$Iscr,rms = \frac{I0,rms}{\sqrt{2}}\, pri\ čemu\ je\ I0,rms = \frac{V0,rms}{R}$$

$$P = \frac{Vrms^2}{R}$$

$$P0 = Irms^2 \cdot R$$

$$Pdc = I0 \cdot Vdc\ pri\ cemu\ je\ I0 = \frac{\frac{2Vm}{\pi} - Vdc}{R}$$

$$Pf = \frac{P}{S} = \frac{P}{Vrms \cdot Irms} = \frac{P}{Vrms \cdot \frac{Vrms}{R}}$$

$In = \frac{Vn}{Zn}; Vn = \sqrt{an^2 + bn^2};$

$$\Delta I0 = X.\ Zadano..\ Bude\ zadan\ kao\ uslov\ pa\ je\ (-x, x)\ odnosno\ od\ vrha\ do\ vrha$$

$$an = \frac{2Vm}{\pi}\left[\cos\left(\frac{(n+1)\cdot\alpha}{n+1}\right) - \cos\left(\frac{(n-1)\cdot\alpha}{n-1}\right)\right]$$

$$bn = \frac{2Vm}{\pi}\left[\sin\left(\frac{(n+1)\cdot\alpha}{n+1}\right) - \sin\left(\frac{(n-1)\cdot\alpha}{n-1}\right)\right]$$

$$THD = \frac{\sqrt{Irms^2 - I1,rms^2}}{I1,rms},\ pri\ čemu\ je\ I1\ prva\ oscilacija$$

$$I1,rms = \sqrt{\left(\frac{a1}{\sqrt{2}}\right)^2 + \left(\frac{b1}{\sqrt{2}}\right)^2}$$

$$a1 = \frac{Vs,rms}{R}\left[1 - \frac{\alpha}{\pi} + \frac{\sin(2\alpha)}{2\pi}\right]$$

$$b1 = \frac{Vs,rms}{R}\left[\frac{\cos(2\alpha) - 1}{2\pi}\right]$$

USLOV ZA TIRISTOR DA LI RADI ISPRAVNO ILI NE: $\alpha < \theta$