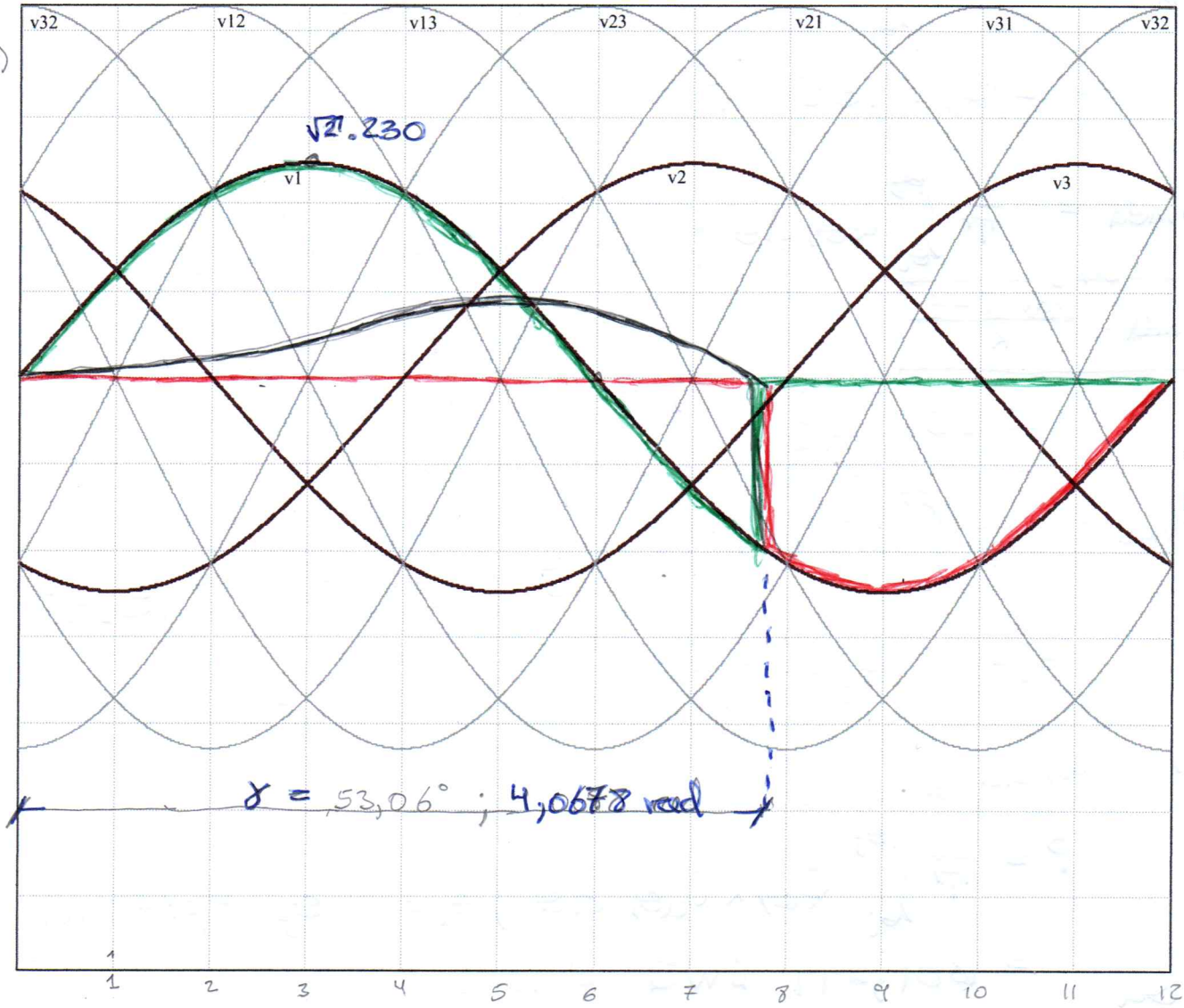
CAEX1 detailed.

Nome: Sergio Número: 1020881

b)



$v_o(t)$

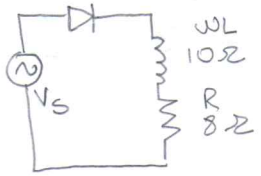
$i_o(t)$

$v_{DIO}(t)$

$v_s = \underbrace{230\sqrt{2}}_{325,26}\,\text{sen}(100\pi t)$; $R = 8\Omega$; $X = 10\Omega$; $\pi = 2\pi$; $\theta = \omega t$

$Z = 12,806 \angle 0,896 \text{ rad } (51,34°)$

$\alpha = 0$, pq Diodo



$i(\theta) = 0 \Rightarrow \theta =$

∅
0 → 0°
γ = 4,0678 → 233,06°
7,1767
etc

a) tempo de condução: $\begin{cases} 50\text{Hz} = 0,02 \text{ sec} \\ 2\pi \text{ rad} = 0,02 \text{ sec} \end{cases}$

$\therefore$

$\frac{0,02 \text{ sec}}{2\pi \text{ rad}} \times 4,0678 \text{ rad} = 0,0129 \text{ sec}$

c) $V_{o\,méd} = \frac{1}{\pi}\int_{\theta_i}^{\theta_f} \sqrt{2}.230\,\text{sen}(\theta)\,d\theta$; $\theta_i = 0 \wedge \theta_f = 4,0678$

$= 82,8741 \text{ V}$

c)

$$V_{orms} = \sqrt{\frac{1}{\pi}\int_{\theta_i}^{\theta_f} V_s^2(\theta)\, d\theta} \quad ; \theta_i = 0,\ \theta_f = 4{,}0678 \text{ rad};\ \pi = 2\pi$$

$$= 173{,}7935 \ V$$

$$i_{oméd} = \frac{1}{\pi}\int_{\theta_i}^{\theta_f} i_o(\theta)\, d\theta \ ; \quad i_\theta = \frac{V_{smax}}{|Z|}\sin(\theta + \alpha - \phi) - \left(\frac{V_{smax}}{|Z|}\cdot \sin(\alpha - \phi)\right) \times e^{-\frac{R}{\omega L}\theta}$$

or

$$\boxed{i_{oméd} = \frac{V_{oméd} - E}{R}}$$

$$= 10{,}359 \ [A] \quad ; \theta_i = 0 \ \wedge \ \theta_f = 4{,}0678 \text{ rad}$$

$$i_{orms} = \sqrt{\frac{1}{\pi}\int_{\theta_i}^{\theta_f} i_o^2\theta\, d\theta} = 15{,}0058 \ [A] \tilde{=} 15 [A]$$

$\theta_i = 0 \ \wedge \ \theta_f = 4{,}0678$ rad.

d) Potencia decipada:

$$P = \frac{1}{\pi}\int_{\theta_i}^{\theta_f} V_o(\theta) \times i_o(\theta)\, d\theta \ ; \theta_i = 0 \ \wedge \ \theta_f = 4{,}0678 \text{ rad.}$$

$$\tilde{=} 1801{,}399 \ [W] \tilde{=} 1800 \ [W]$$

ou

$$P = R \times i_{orms}^2 = 8 \times 15^2 = 1800 \ [W]$$

e) FP = ?

$$PP = \frac{P}{S} \ ; \ P \tilde{=} 1800 \ [W]$$

$$S = V_{irms} \times i_{irms} \ ; \ i_{irms} = i_{orms}$$

$$= 230 \times 15 \qquad V_{irms} = 230$$

$$= 3450 \ [VA]$$

$$FP = \frac{1800}{3450} = 0{,}521$$