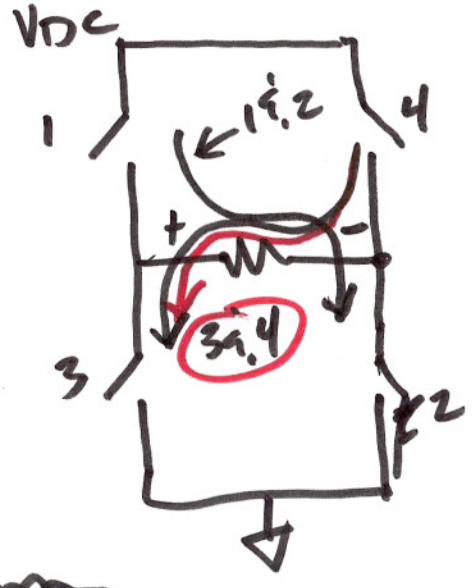
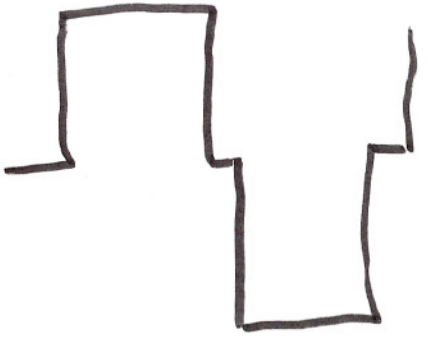


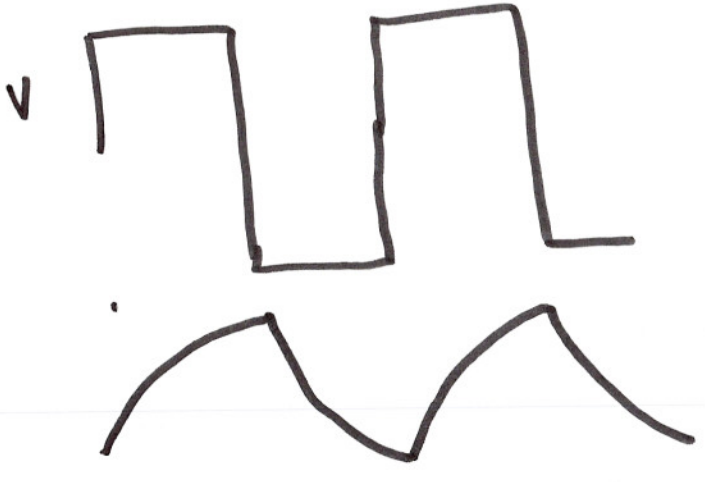
1 & 2 $+V_{DC}$

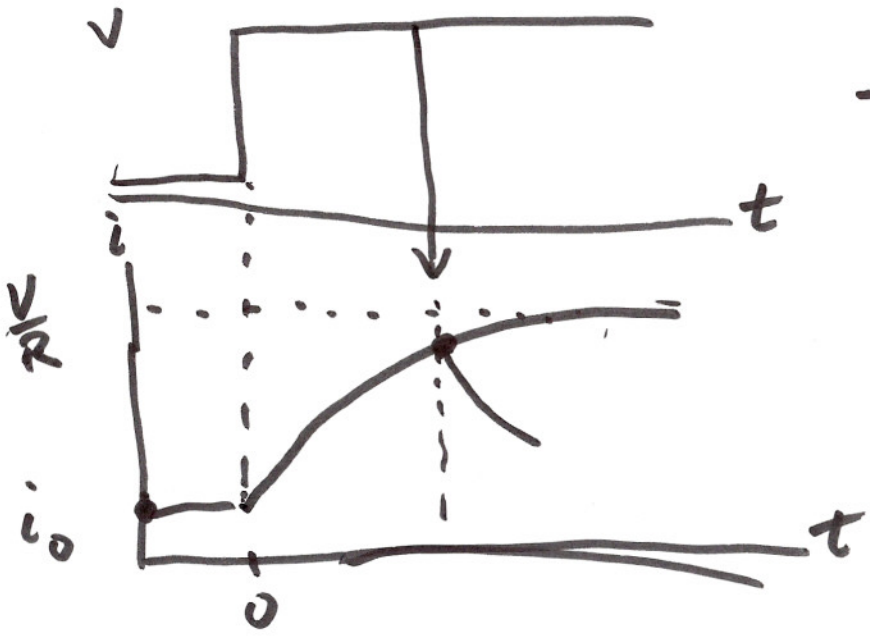
3 & 4 $-V_{DC}$

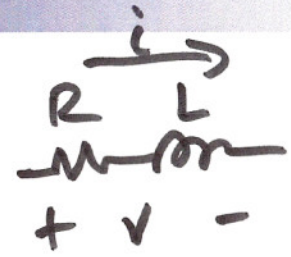
V_{P-P} $2V_{DC}$

$i_L = \pm \frac{V_{DC}}{R}$









$$i(t) = i_f + (i_0 - i_f)\, e^{-t/\tau}$$

$$\tau = \frac{L}{R}$$

$$i(t) = \frac{V_{DC}}{R} + \left(i_{min} - \frac{V_{DC}}{R}\right) e^{-t/\tau}$$

$$i\left(\frac{T}{2}\right) = -i_{min} + \left(i_{min} - \frac{V_{DC}}{R}\right) e^{-\frac{T}{2\tau}}$$

$$i_{max} = \frac{V_{DC}}{R} + \left(-i_{max} - \frac{V_{DC}}{R}\right) e^{-\frac{T}{2\tau}}$$

$$i_{max}\left(1+e^{-\frac{T}{2\tau}}\right)=\frac{V_{DC}}{R}\left(1-e^{T/2\tau}\right)$$

$$i_{max}=\frac{V_{DC}}{R}\,\frac{1-e^{T/2\tau}}{1+e^{T/2\tau}}=-i_{min}$$

$$I_{Rms}=\sqrt{\frac{1}{T}\int_0^T i^2(t)\,dt}=\sqrt{\frac{2}{T}\int_0^{T/2}\left[\frac{V_{DC}}{R}+\left(i_{min}-\frac{V_{DC}}{R}\right)e^{-\frac{t}{\tau}}\right]^2 dt}$$

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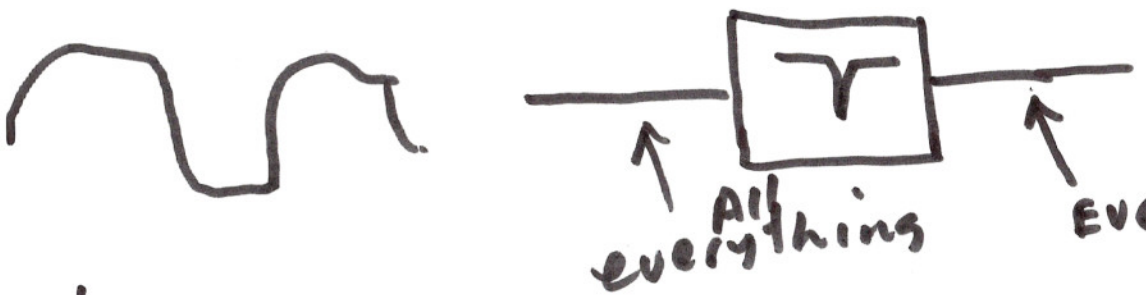
For a square wave

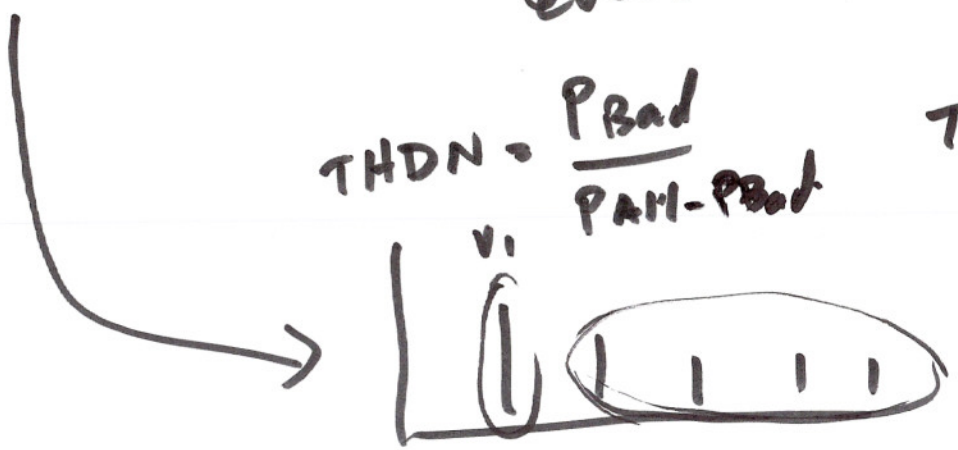
$$v_o(t) = \sum_{\text{odd } n} \frac{4 V_{dc}}{n\pi} \sin n\omega t$$

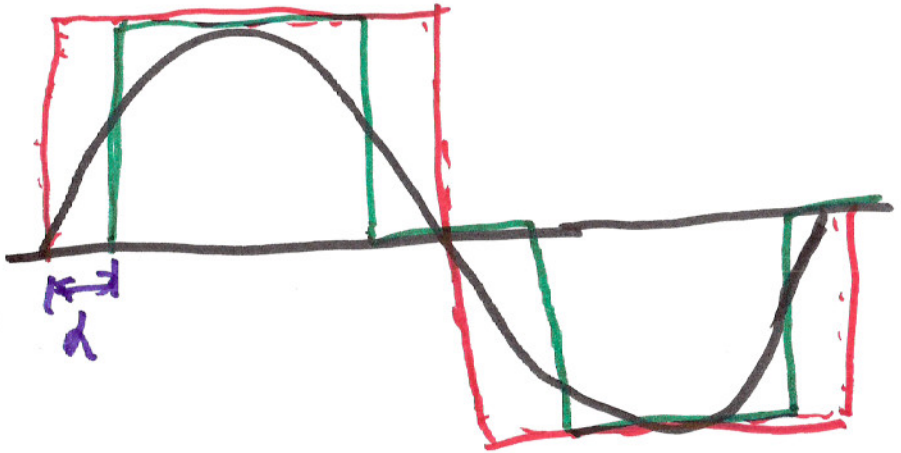
THD Total Harmonic Distortion

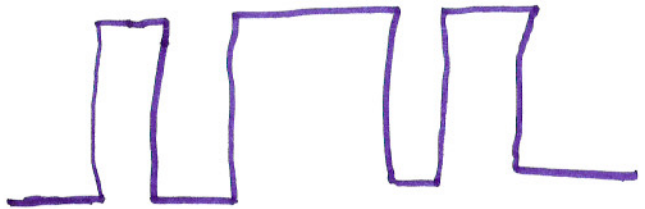


$$THDN = \frac{P_{Bad}}{P_{All} - P_{Bad}}$$

$$THD = \frac{\sqrt{\sum_{n=2}^{\infty} V_n^2}}{\sqrt{V_1^2}}$$







$$v = \frac{4V_{DC}}{\pi} \cos(n\alpha) \qquad \alpha = \frac{90^\circ}{n} \qquad \frac{90}{5} = 18$$