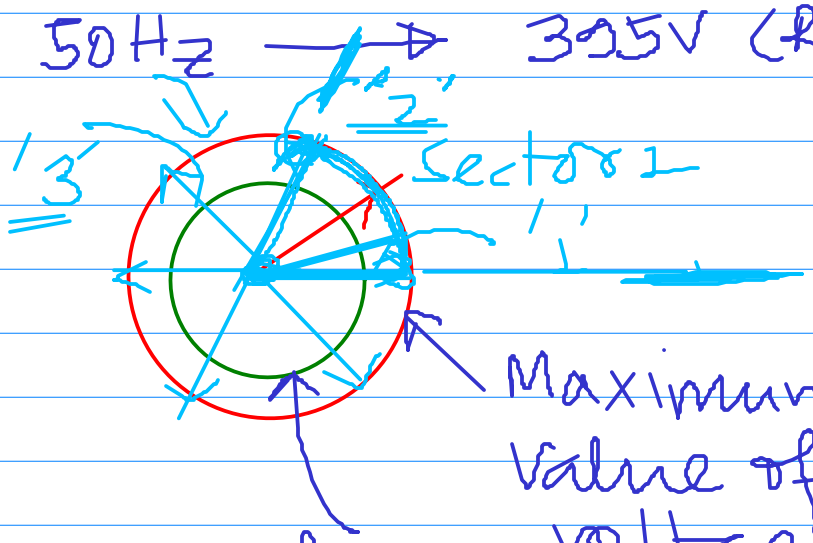
415V (AC)

↓

560V → 50Hz → 395V (RMS) Line to line



Maximum possible value of output voltage at 50Hz

Space vector for 20Hz

$= \frac{2}{5} \times 485V$

$= 194V, 20Hz$

$\Rightarrow 560 \times \frac{\sqrt{3}}{2}$

$= 485V, 50Hz$

100μsec ⇒ 50msec

$\Delta\theta|_{50Hz} = 1.8°$

⇒ 500 steps ⇒ 360° / cycle

$\Delta\theta|_{20Hz} = \frac{360}{500} = 0.72°$

$\theta_2 = 2 \times 72$

$\theta_1 = 072$

$\theta = 0$

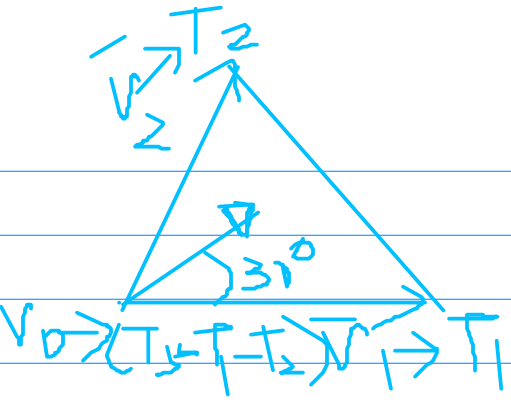
$\frac{194V \angle 0°}{194V \angle 72°} \Rightarrow (T_1, T_2, T_0)$

T_1: Active vector 1

T_2: Active vector 2

T_0 & Null Vector

$\therefore 72 \times 42 = \underline{30.24^\circ}$



$V \angle \theta = \underline{194 \angle 30.24}$

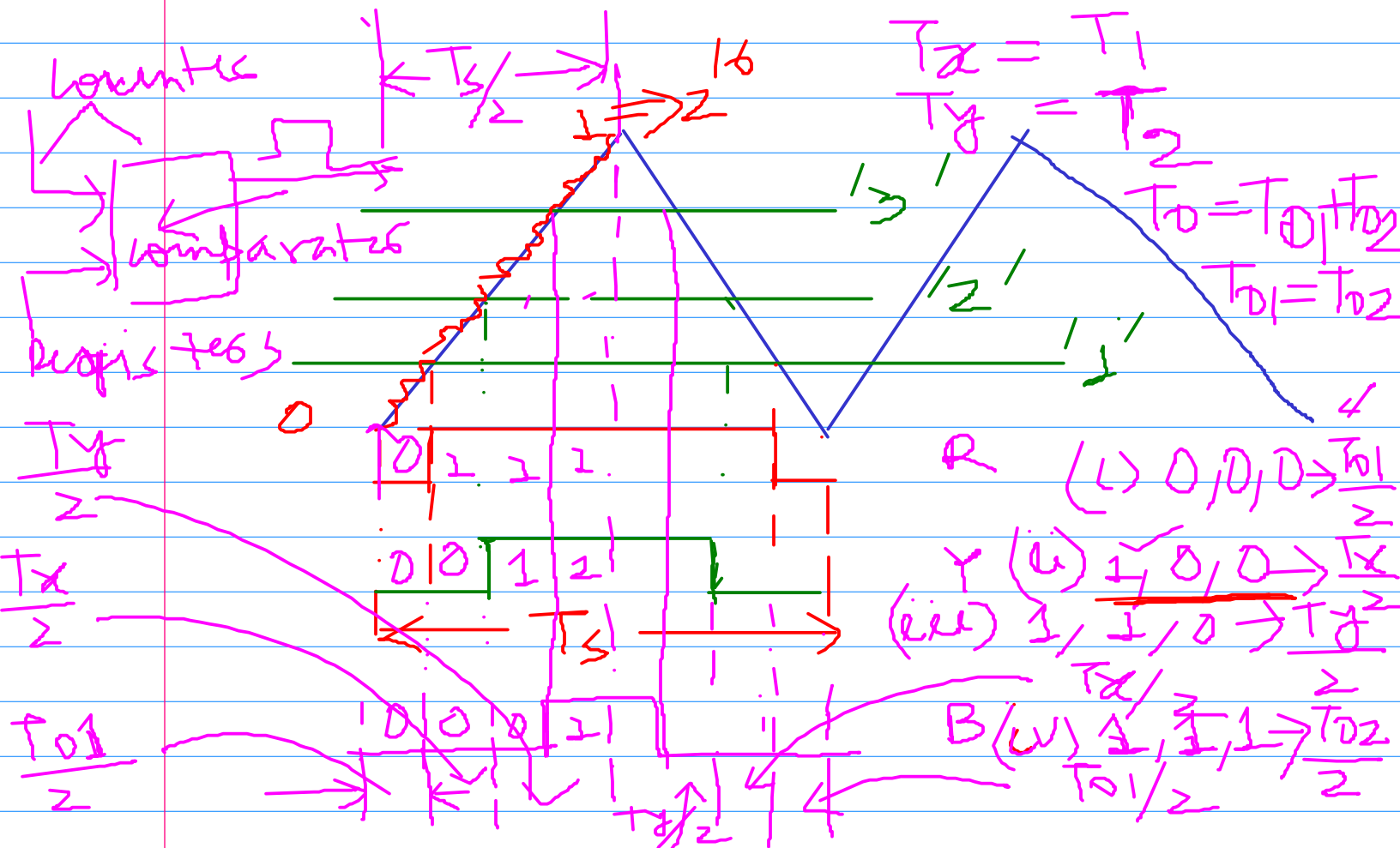
$T_s = 100 \mu sec$

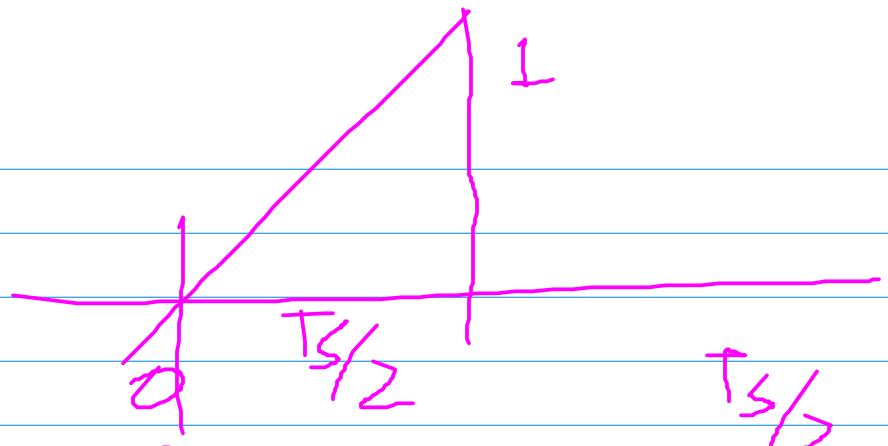
$$T_2 = \frac{V_{ph} \sin\theta \, T_s}{V_{dc} \times \frac{\sqrt{3}}{2}} = \underline{20.24 \mu sec}$$

$$T_1 = \frac{V \cos\theta \times T_s - \frac{V_{dc}}{2} \times T_2}{V_{dc}}$$

$$= \underline{\underline{9.88 \mu sec}}$$

$T_s - T_1 - T_2 = 100 - 40.12 = \underline{59.87 \mu sec}$





$T_s/2 \rightarrow 1$

$\frac{T_{01}}{2} \rightarrow \frac{2}{T_s} \times \frac{T_{01}}{2}$

'1' → First comparison value $\Rightarrow \frac{T_{01}}{T_s}$

$T_{01} = \frac{T_0}{2}$

$T_s \Rightarrow 2^{16}$

'2' → $\frac{T_{01}}{2} + \frac{T_1}{2} \rightarrow \frac{T_{01} + T_1}{T_s}$

'3' → $\frac{T_{01}}{2} + \frac{T_1}{2} + \frac{T_2}{2} \rightarrow \frac{T_{01} + T_1 + T_2}{T_s}$

Comparator — Counter Unit (DSP)

Load comparator registers with '1', '2', '3' values → Switching pulses of the three phase inverter