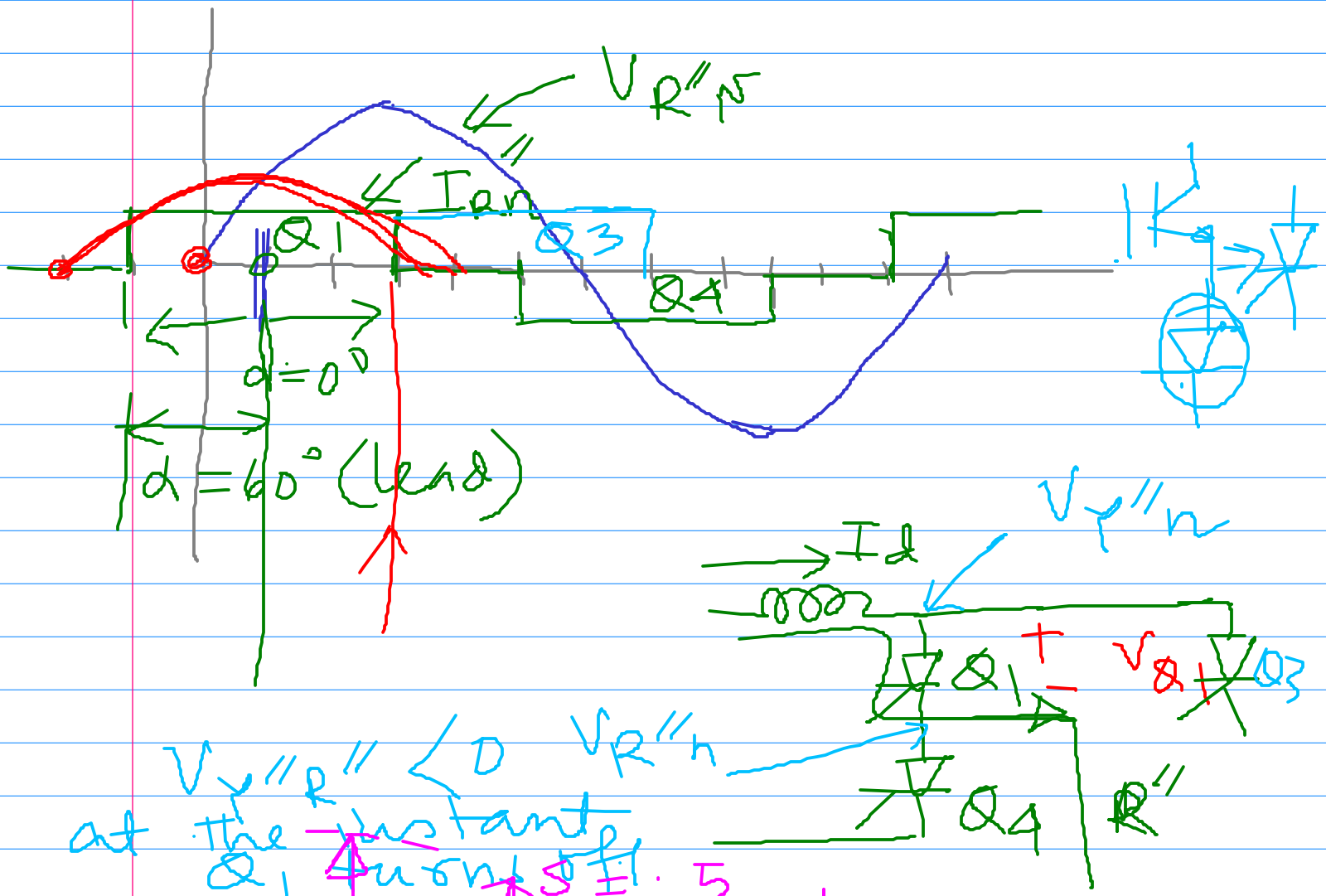


$V_{r''R''} < 0$ $V_{R''n}$

at the instant Q_1 turns ON. S = 1.5

$S = S_{sl}$ — $S = 1$

$I_{R''}$ — n_2 — α — V_s

I_R

I_s

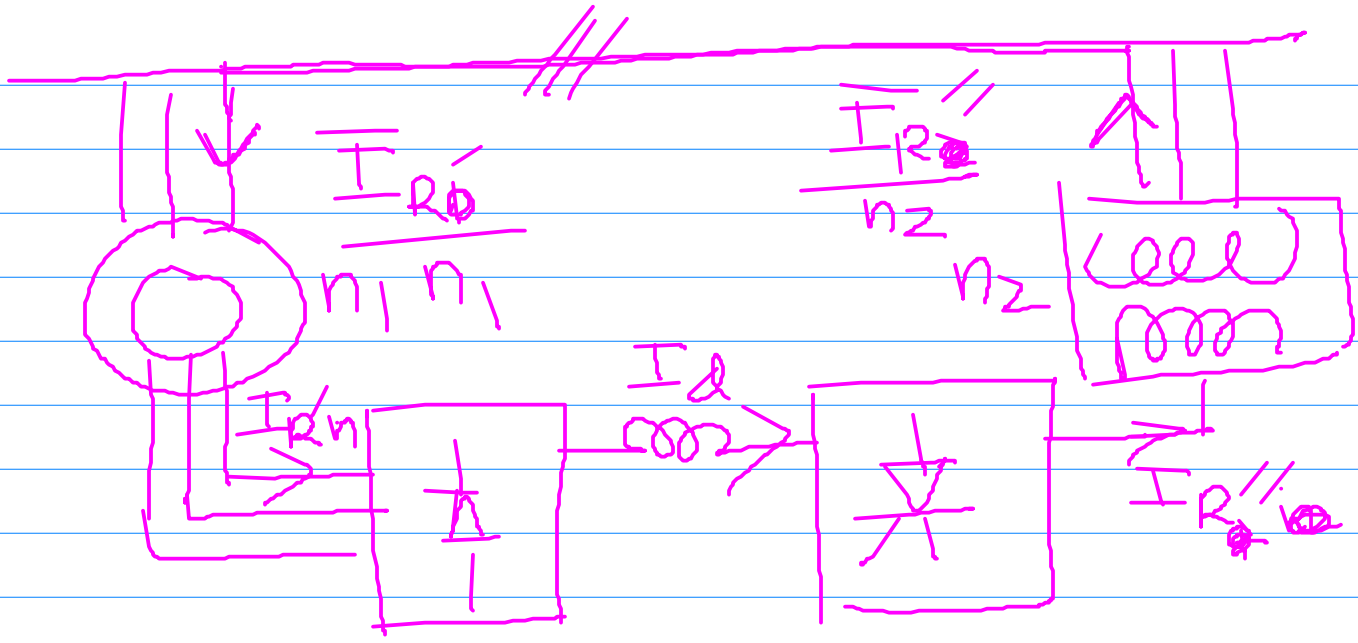
n_1

$S = 1$

$I_s \Rightarrow S = S_{sl}$

n_2: Txr turns ratio

$V_{R''n}$ n_1: Stator to rotor turns ratio



$$\bar{I}_s = \frac{\bar{I}_R'}{n_1} - \frac{\bar{I}_R''}{n_2}$$

415V (L-L)

For a 500 Hp, Wound Rotor Machine the rated slip is 3% and the slip at maximum torque is 12%. Ignore all other resistances and reactances except the rotor resistance (R_2) and (X_2). This is a 4 pole, 50 Hz machine and it is used in the slip power recovery drive. Find the firing angle α for running the rotor at 500 rpm, 1000 rpm and 1200 rpm. Assume, $n_1 = n_2 = 1$.