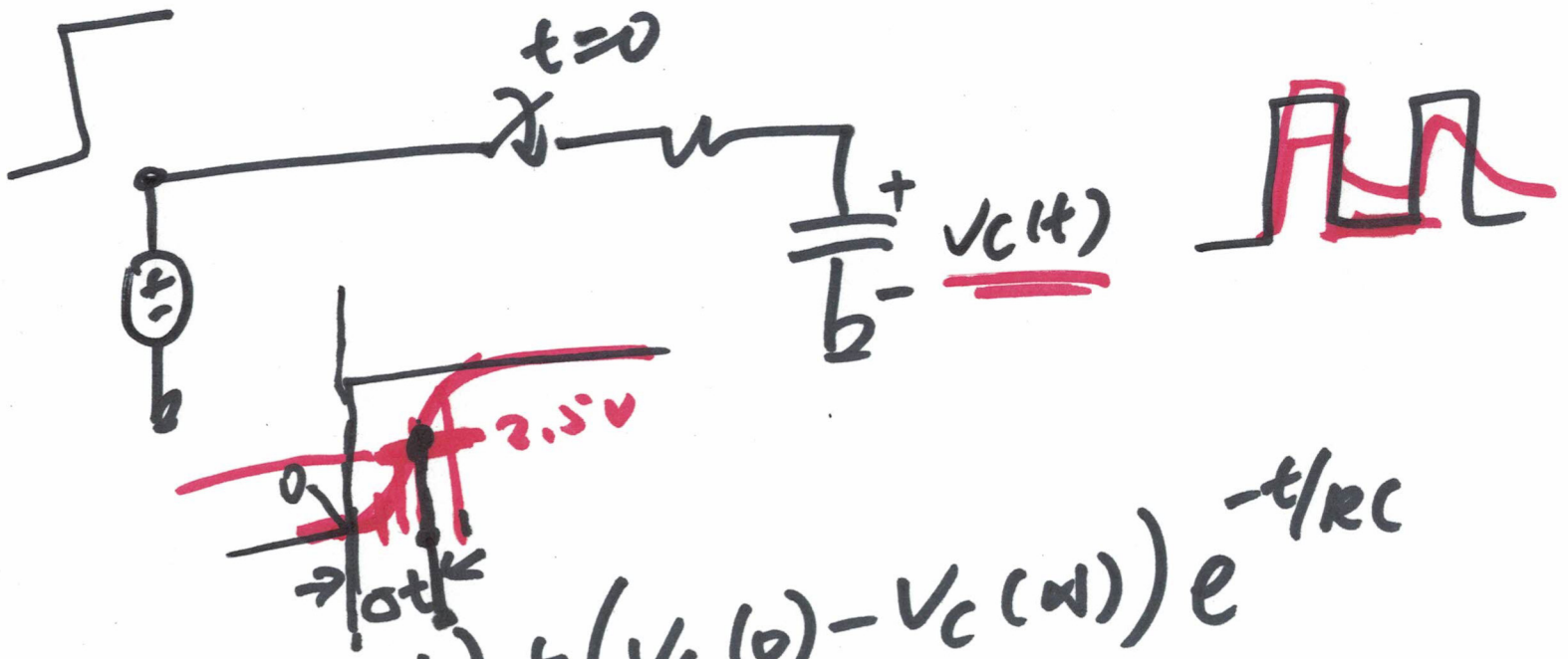


$$V_C(t) = V_C(\infty) + (V_C(0) - V_C(\infty))\, e^{-t/RC}$$

$$= V_{DD} + (0 - V_{DD})\, e^{-t/RC}$$

$$= V_{DD}(1 - e^{-t/RC})$$

$$1\tfrac{1}{2} = \tfrac{3}{2} = 1 - e^{-t/RC}$$

$$-t/RC = -0.5$$

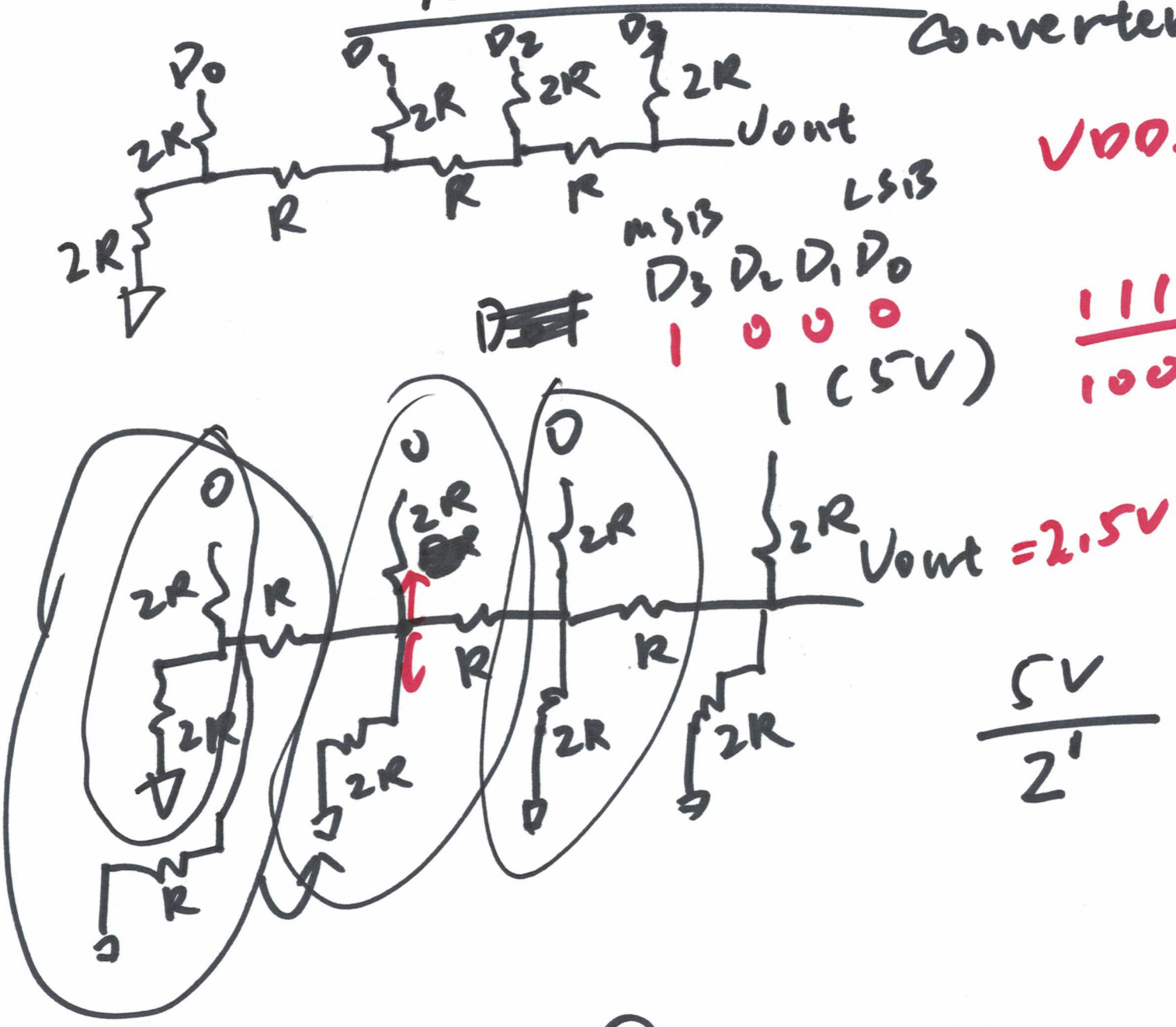
$$\Rightarrow \ln e^{-t/RC} = \ln 0.5$$

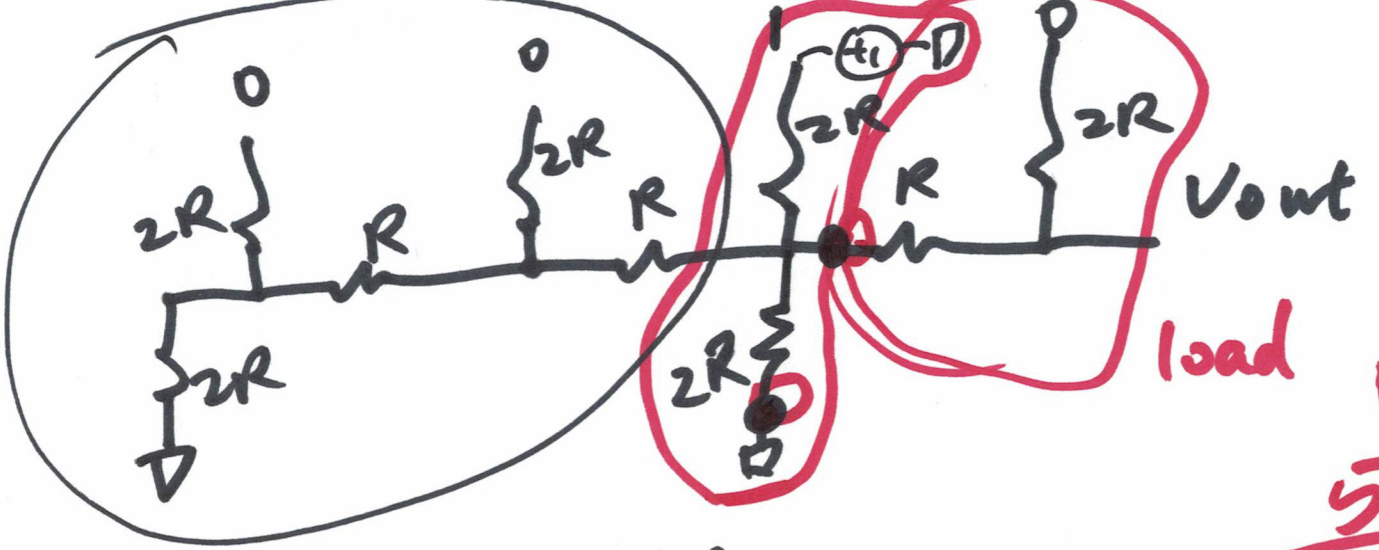
$$\Rightarrow 0.7 = \frac{t}{RC}$$

$$t = 0.7RC$$

$$\Rightarrow \Delta t$$

R-2R DAC Digital to Analog Converter

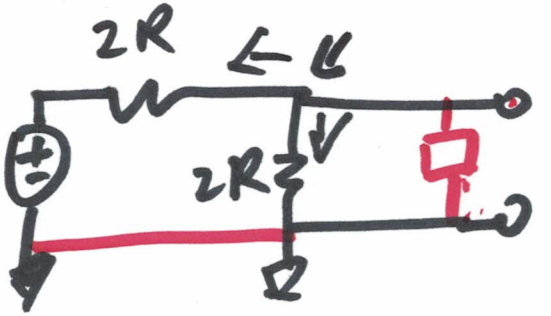




D_3:

$$\frac{5}{2^2} = \frac{5}{4} = 1.25$$

$\frac{5}{32}$



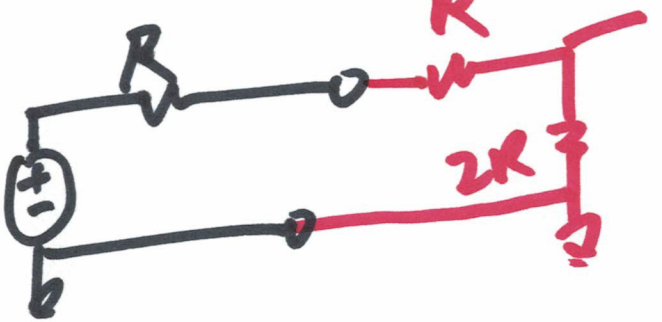
$D_4 D_3 D_2 D_1 D_0$ resolution

$= 1100$ LSB

$= 1011$

$\frac{5V}{2}$ 0 $\frac{5V}{8}$ $\frac{5V}{16}$

$R_{TH} = R$ $V_{TH} = 2.5V$



$V_{out} = 1.25V$