Nolan Anderson Quiz 2B

1) $A_d = 40\ V/V$ $A_{CM} = 0$

$R_{id} = 100 = 2R_1$

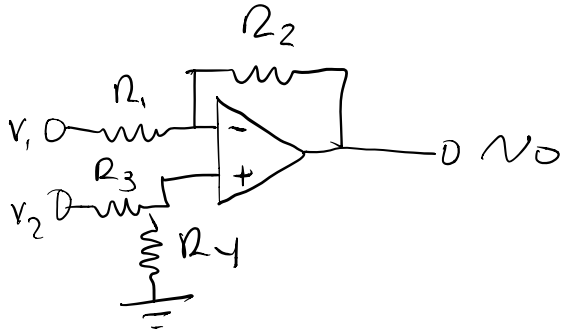
$R_1 = 50\ k\Omega$

$A_d = 100 = \frac{R_2}{R_1} = 100\frac{R_2}{50}$

$5{,}000 = R_2 \Rightarrow R_2 = 5\ M\Omega$

$\boxed{R_4 = R_2 = 5\ M\Omega}$

$\boxed{R_3 = R_1 = 50\ k\Omega}$



2) $3\ V/V \leq A_d \leq 300\ V/V$ $R_{OL} = 100\ k\Omega$ $\frac{R_4}{R_3} = 1$

$A_d = \left(1 + \frac{2R_2}{2R_1}\right)\left(\frac{R_4}{R_3}\right)$ Let $R_4 = R_3 = 100\ k\Omega$

second stage gain

$2R_1 = R_F + 100\ k\Omega$ { max: $R_F + 100$, min: R_F

$A_d = 3$ or $A_d = 300$

$\left(1 + \frac{2R_2}{R_F + 100}\right)(1) = 3$ $\frac{2R_2}{R_F + 100} = 2$

$2R_2 = 2(R_F + 100\ k\Omega)$ $2R_2$ $R_2 =$

$149.5 R_F$

$\left(1 + \frac{2R_2}{R_F}\right)(1) = 300$ $2R_2 = 299 R_F$

$R_2 = \frac{299 R_F}{2}$

$294rF = 2rF + 200E3$ $297rF = 200E3$

$R_2 = 149.5\ k\Omega$ $294\,rF = 2RF + 200\times10^3\,\Omega$

$297rF = 200\times10^3$ $2R_2 =$ $R_2 = 149.5rF$

$RF = 673.40\ \Omega$

$R_2 = 100,673.4 = 100.673\ k\Omega$