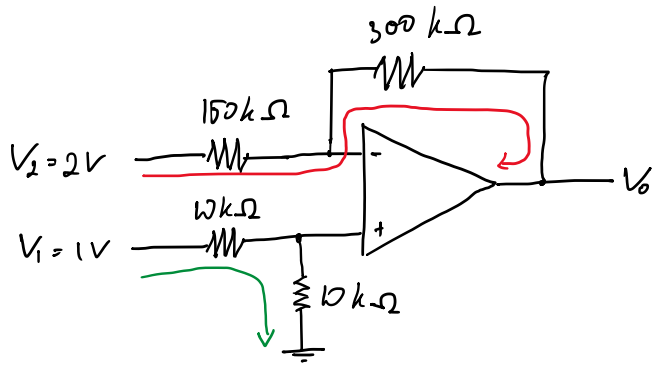


1.



$$V_+ = \frac{10 \text{ k}\Omega}{10 \text{ k}\Omega + 10 \text{ k}\Omega} \cdot V_1 = \frac{1}{2} \cdot 1 \text{ V} = 0,5 \text{ V}$$

$$V_+ = V_- = 0,5 \text{ V}$$

$$I_{150} = I_{300}$$

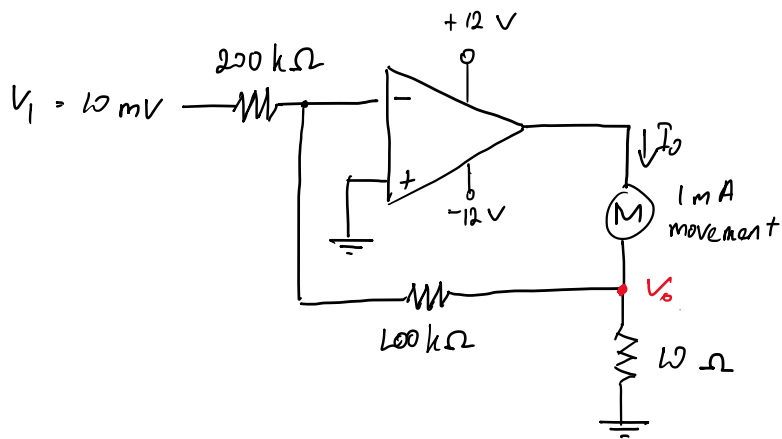
$$\frac{V_2 - V_-}{\cancel{150 \text{ k}\Omega}_1} = \frac{V_- - V_0}{\cancel{300 \text{ k}\Omega}_2}$$

$$\frac{2 - 0,5}{1} = \frac{0,5 - V_0}{2}$$

$$3 = 0,5 - V_0$$

$$V_0 = -2,5 \text{ V}$$

2.



$$R_1 = 200 \text{ k}\Omega$$

$$R_f = 100 \text{ k}\Omega$$

$$R_s = 10 \Omega$$

$$V_+ = V_- = 0 \text{ V}$$

$$\frac{V_1 - V_-}{R_1} = \frac{V_- - V_0}{R_f}$$

$$\frac{10 \text{ mV} - 0}{\cancel{200 \text{ k}\Omega}} = \frac{0 - V_0}{\cancel{100 \text{ k}\Omega}}$$

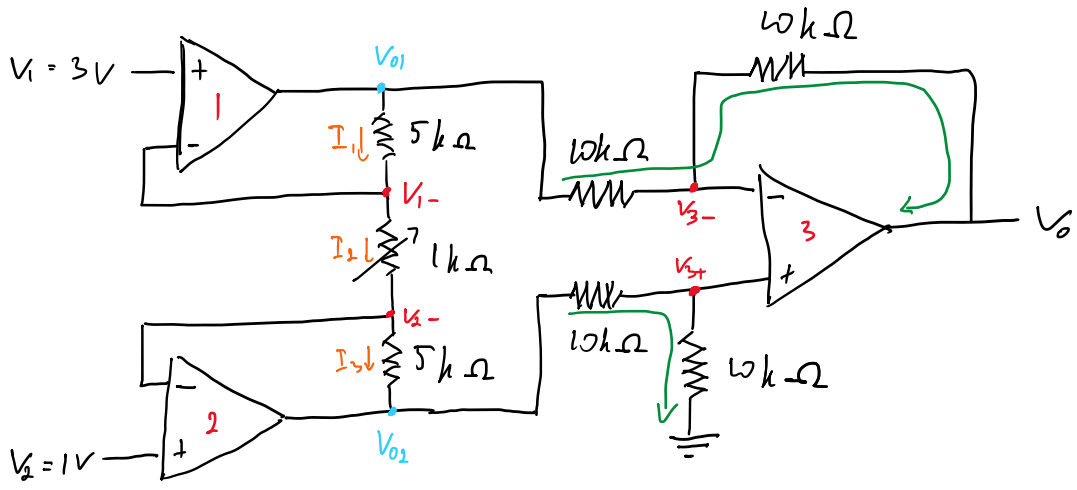
$$V_0 = -5 \text{ mV}$$

$$I_0 = \frac{V_0}{R_s}$$

$$I_0 = \frac{-5 \text{ mV}}{10 \Omega}$$

$$I_0 = -0,5 \text{ mA}$$

2.



$$V_{1+} = V_{1-} = 3V$$

$$V_{2+} = V_{2-} = 1V$$

$$I_1 = I_2 = I_3$$

$$\frac{V_{01} - V_{1-}}{R} = \frac{V_{1-} - V_{2-}}{R_p} = \frac{V_{2-} - V_{02}}{R}$$

$$\frac{V_{01} - 3}{5k\Omega} = \frac{3 - 1}{1k\Omega} = \frac{1 - V_{02}}{5k\Omega}$$

$$\frac{V_{01} - 3}{5} = 2 = \frac{1 - V_{02}}{5}$$

$$V_{01} - 3 = 10 = 1 - V_{02}$$

$$V_{01} = 13V$$

$$V_{02} = -9V$$

$$V_{3+} = \frac{10k\Omega}{10k\Omega + 10k\Omega} \cdot V_{01}$$

$$V_{3+} = \frac{1}{2} \cdot 13V$$

$$V_{3+} = 6.5V$$

$$V_{3-} = V_{3+} = 6.5V$$

$$\frac{V_{01} - V_{3-}}{10k\Omega} = \frac{V_{3+} - V_0}{10k\Omega}$$

$$13 - 6.5 = 6.5 - V_0$$

$$V_0 = 22V$$