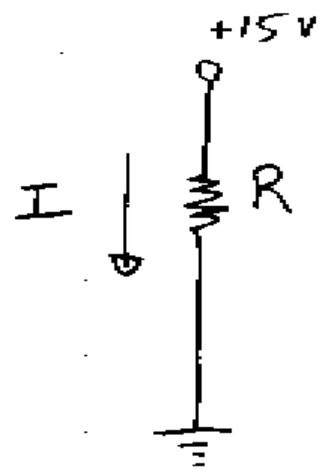
Hand out #1 LAB 3.

(1)



R has max Power of .25 W

$15 = IR$ $\qquad P = \frac{V^2}{R} = I^2 R$

$.25 = \frac{(15)^2}{R}$ $\qquad$ **$R = 900\,\Omega$**

⇒ **Choose $R > 900\,\Omega$ when connected +15 V to ground.**

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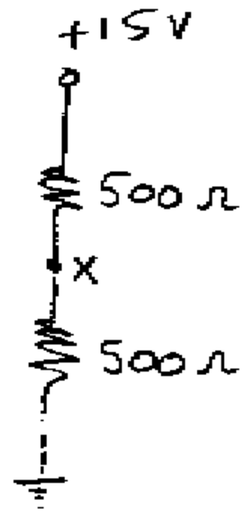
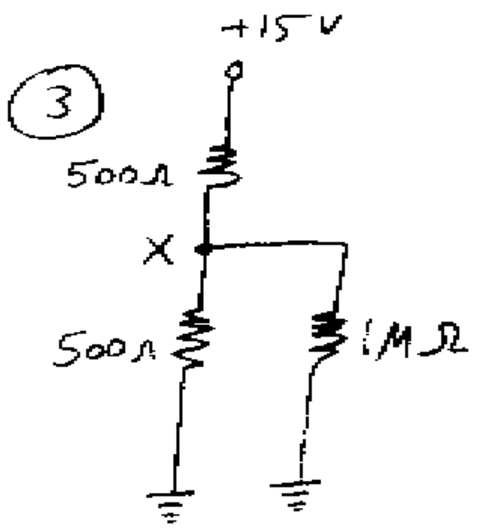
(2)



$V_x = 7.5$ V

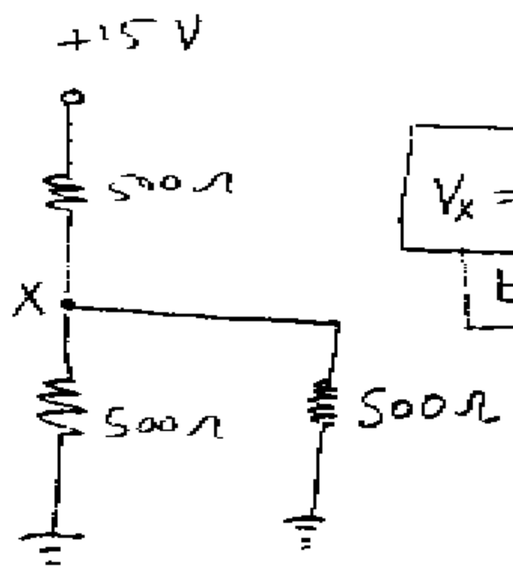
(3)



$V_x = 7.498$ V

OK

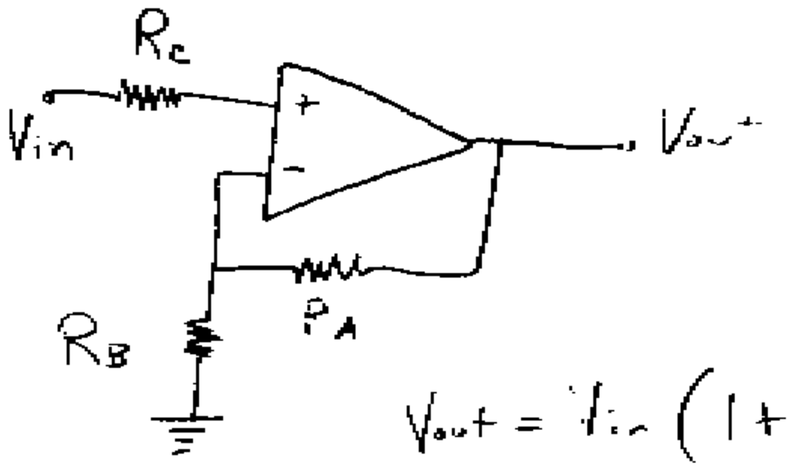
(4)



$V_x = 5$ V

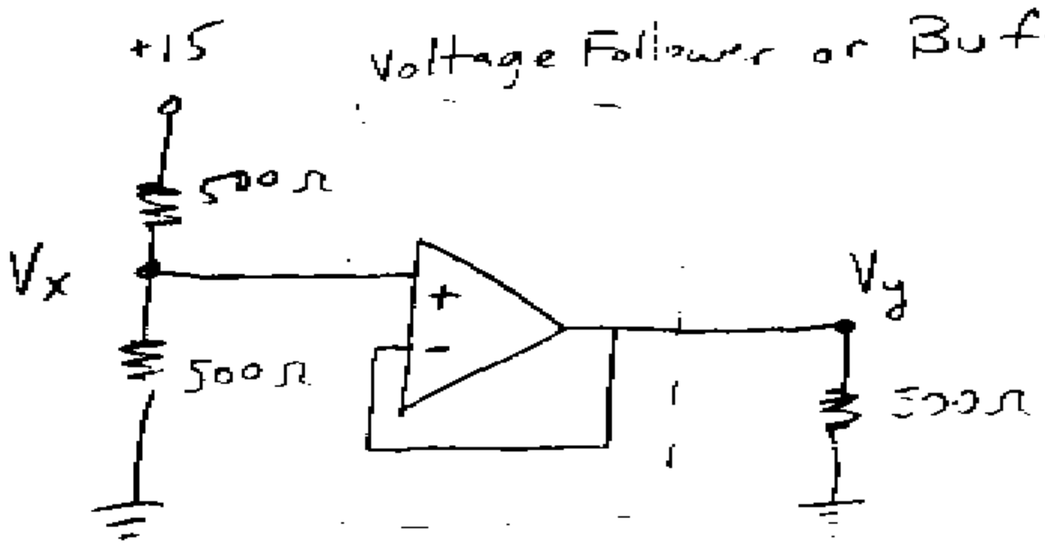
bad

(5)



$V_{out} = V_{in}\left(1 + \frac{R_A}{R_B}\right)$

(5) Voltage Follower or Buffer. ($R_A = 0$, $R_B \to \infty$)



$V_x = V_y = 7.5$ V

OK.

VII. Finding V_L, V_H.

V_L: $$V_g(+) = V_t(+)\left[\frac{Rf_1}{Rf_1 - Rf_2}\right] + V_s(+)\left[\frac{Rf_2}{Rf_1 + Rf_2}\right]$$

V_L is the value of $V_t(+)$ when $V_g(+) = 0$. $V_s(+) = 15$

$$\Rightarrow V_t(+)\,Rf_1 = -V_s(+)\,Rf_2 \quad (V_t(+) = V_L)$$

$$\Rightarrow \boxed{V_L = \frac{-15\,Rf_2}{Rf_1}}$$ see pt ② from lecture

V_H: $$V_g(+) = V_t(+)\left(\frac{Rf_1}{Rf_1 + Rf_2}\right) + V_s(+)\left[\frac{Rf_2}{Rf_1 - Rf_2}\right]$$

V_H is the value of $V_t(+)$ when $V_g(+) = 0$ $V_s(+) = -15$

$$V_t(+)\,Rf_1 = -V_s(+)\,Rf_2 \quad (V_t(+) = V_H)$$

$$\boxed{V_H = \frac{15\,Rf_2}{Rf_1}}$$ see pt ④ from lecture

This page corresponds with LAB 3 Figure 2.