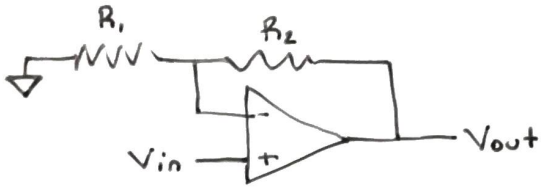
Lab 4 Pre-Lab

1) Under the short assumption for C, cleaned up circuit:



10k pot in kit

Non-inverting amp gain = $1 + \frac{R_2}{R_1}$

if we choose $R_2 = 37k$ & $R_1 = 1k$

gain = $1 + \frac{36k}{1k} = 36 + 1 = 37 \frac{V}{V}$

± 10% vals: $gain_+ = 1 + 44 = 45 \frac{V}{V}$ $gain_- = 1 + 29.\overline{45} = 30.\overline{45}$

2) $R_1 = 1k$, $X_c = \frac{1}{\omega C} = \frac{1}{2\pi f C}$

$1k = \frac{1}{2\pi f \cdot 10\mu} \Rightarrow \left[1000(2\pi \cdot 10\mu)\right]^{-1} = f$

$f = 15.915\,H_z$

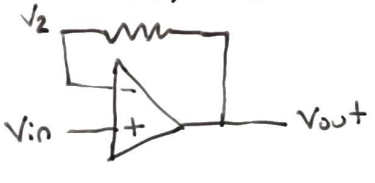
4) Wiper centered: $R_P + R_B = 10k + 22k = 32k$
Wiper nearly full left: $\approx R_B = 22k$

3) Capacitors block DC current $i = C \cdot \frac{dV}{dt}$, $\left(\frac{dV}{dt} = 0\right)$

$i = C \cdot 0$, $i = 0$

R_1 is in series with C so $i_{R_1} = i_C = 0$

New circuit



@ R_B, $i = 0$, so $V_{REF} = V_{in}$, $V_{in} = 5V$. If $V_{in} = 5V$ then $V_2 = 5V$. i @ $R_2 = 0$ now so $V_{out} = V_2$

$V_{out} = 5V$