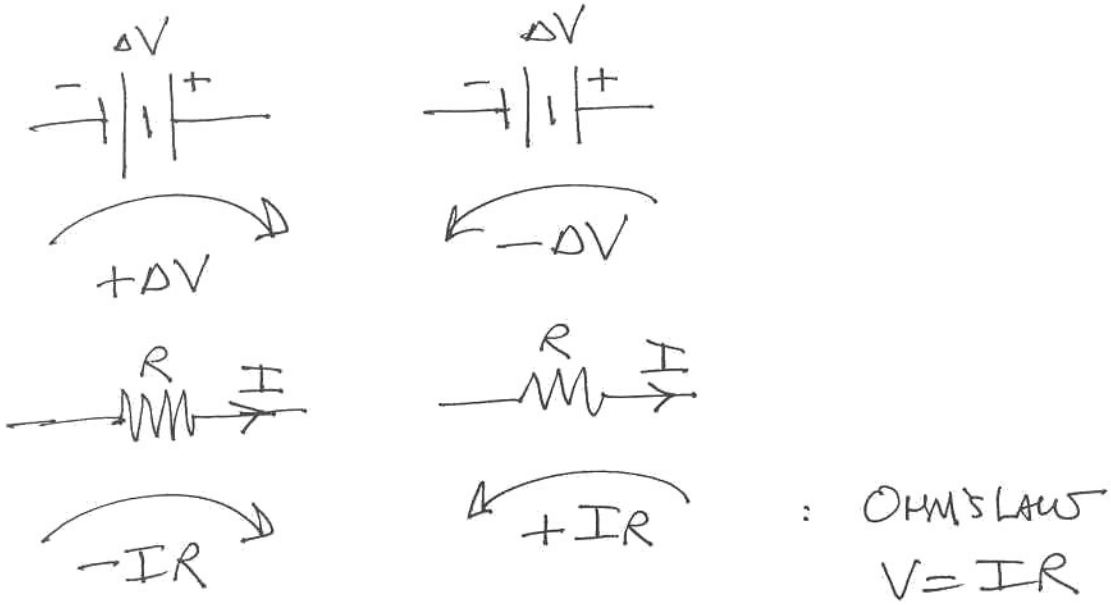
KIRCHHOFF LOOP VOLTAGES

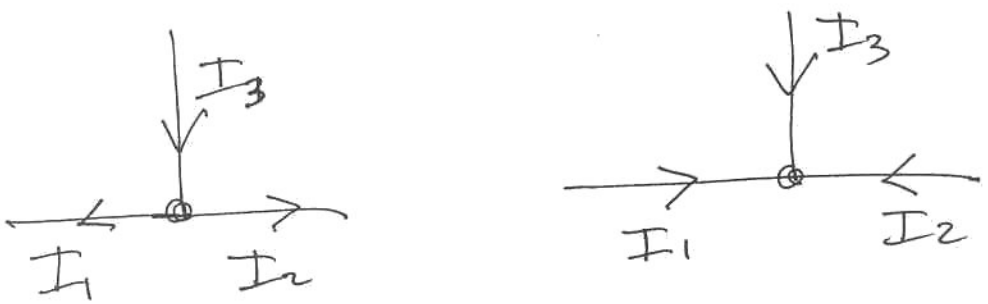
(* CURVED ARROW SHOWS LOOP DIRECTION)



: OHM'S LAW

$V = IR$

KIRCHHOFF JUNCTION CURRENTS

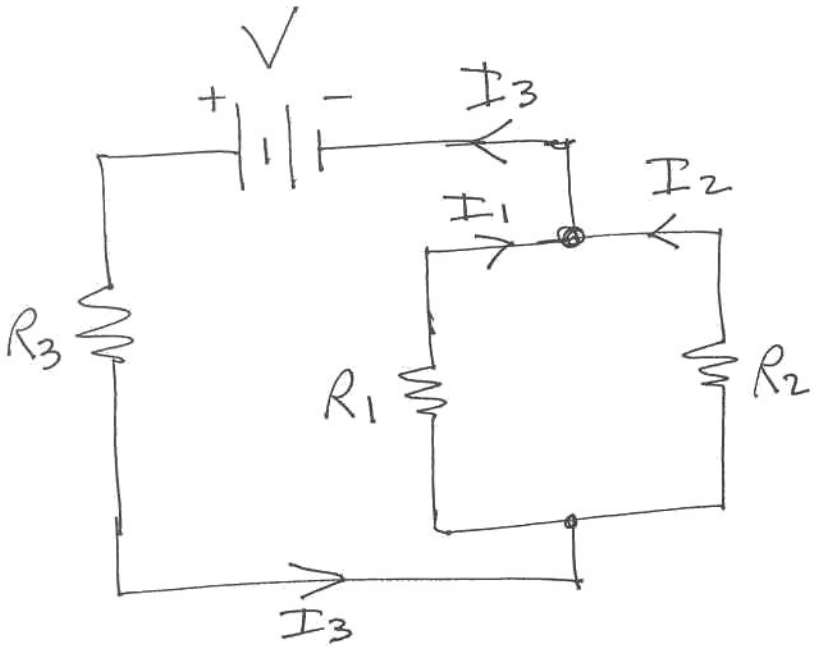


$I_3 = I_1 + I_2$

$I_3 + I_1 + I_2 = 0$

- VOLTAGES AROUND A LOOP ADD UP TO ZERO
- CURRENTS INTO A JUNCTION ADD UP TO ZERO

PRACTICE CIRCUIT (1)



$V =$ _____

$R_1 =$ _____

$R_2 =$ _____

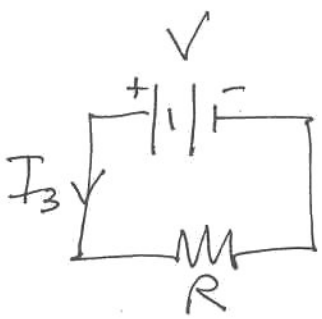
$R_3 =$ _____

◎ THEORY: COMBINE RESISTANCE + OHM'S LAW

$R_{12} = \left(\frac{1}{R_1} + \frac{1}{R_2}\right)^{-1} =$ _____

$R = R_{12} + R_3 =$ _____

$I_3 = V/R =$ _____



$\Delta V_3 = I_3 R_3 =$ _____

$\Delta V_1 = \Delta V_2 = V - \Delta V_3 =$ _____

$I_1 = \Delta V_1 / R_1 =$ _____

$I_2 = \Delta V_2 / R_2 =$ _____

PRACTICE CIRCUIT (2)

◎ EXPERIMENT: MEASURE I_1, I_2, I_3 AND $V, \Delta V_1, \Delta V_2, \Delta V_3$.

	THEORY	EXP	% DIFF
I_1			
I_2			
I_3			

	THEORY	EXP	% DIFF
V			
ΔV_1			
ΔV_2			
ΔV_3			

% DIFF (MAX) = _____

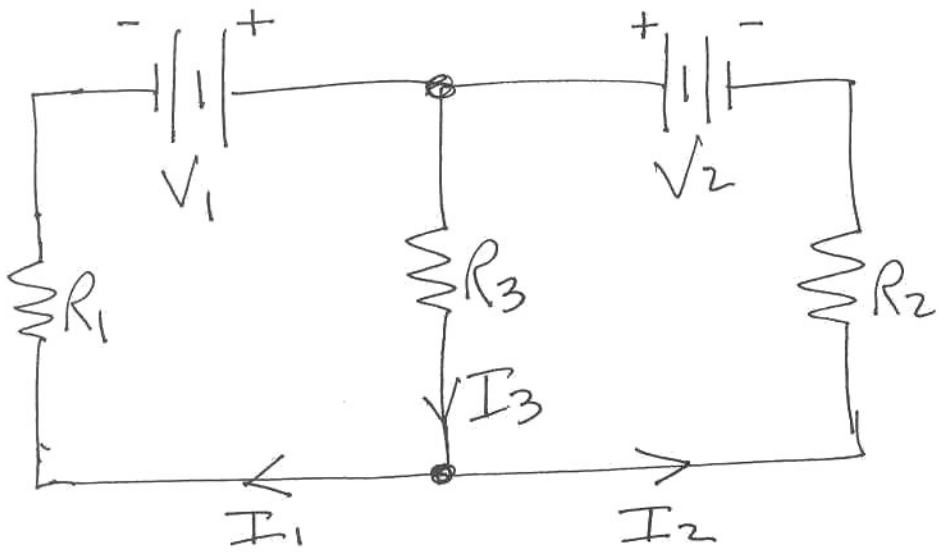
◎ CHECK KIRCHHOFF

LOOP 1 : $V - \Delta V_3 - \Delta V_1 =$ _____

LOOP 2 : $V - \Delta V_3 - \Delta V_2 =$ _____

JUNCTION : $I_3 - I_1 - I_2 =$ _____

KIRCHHOFF CIRCUIT (A): BATTERIES ALIGNED (THROUGH R_3)



$V_1 =$ _____ $R_1 =$ _____

$V_2 =$ _____ $R_2 =$ _____

$R_3 =$ _____

RESULTS (SHOW ALL CALCULATIONS)

$I_{1(THEO)} =$ _____ $I_{1(EXP)} =$ _____ %DIFF = _____

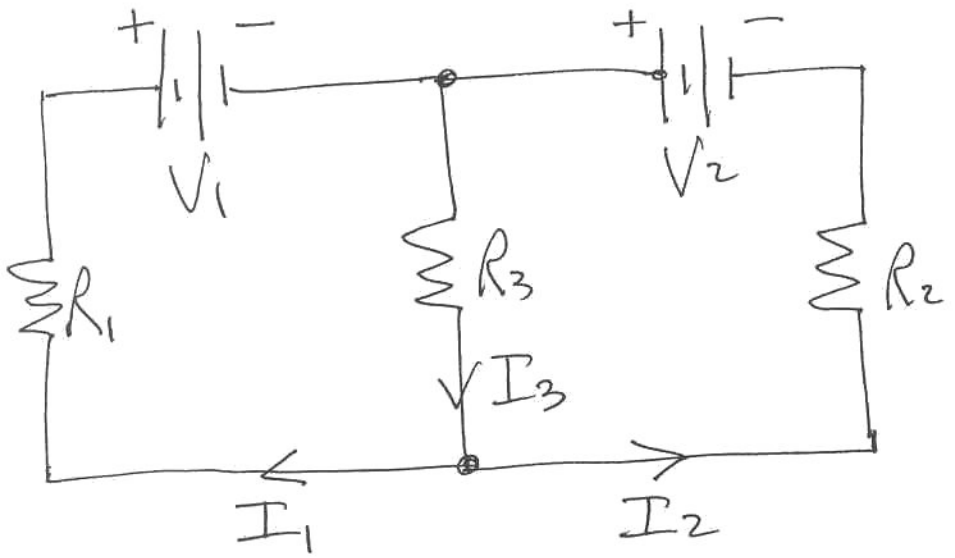
$I_{2(THEO)} =$ _____ $I_{2(EXP)} =$ _____ %DIFF = _____

$I_{3(THEO)} =$ _____ $I_{3(EXP)} =$ _____ %DIFF = _____

* MAXIMUM %DIFF = _____

* % UNC = _____

KIRCHHOFF CIRCUIT (B): BATTERIES ANTI-ALIGNED (THROUGH R_3)



$V_1 =$ _____ $R_1 =$ _____

$V_2 =$ _____ $R_2 =$ _____

$R_3 =$ _____

RESULTS (SHOW ALL CALCULATIONS)

I_1 (THEO) = _____ I_1 (EXP) = _____ % DIFF = _____

I_2 (THEO) = _____ I_2 (EXP) = _____ % DIFF = _____

I_3 (THEO) = _____ I_3 (EXP) = _____ % DIFF = _____

* MAXIMUM % DIFF = _____

* % UNC = _____