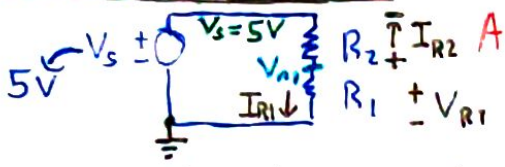
EECS 16A ## 10.8 LECTURE 12 ##

Check out the NVA handout at eecs16a.org.

NODE VOLTAGE ANALYSIS



Approach: K's equations
Comp equations (Ohm's,)

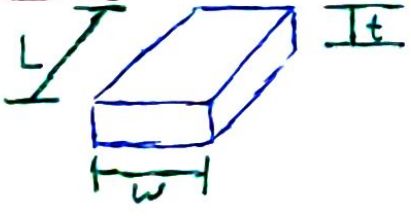
PROCEDURE:
1. choose reference
2. mark known node voltages
3. mark unknown node voltages
4. mark all V_{ei}, I_{ei}
5. KCL for all nodes w/unknown V
6. component equations: $I_{R1} = \frac{V_{R1}}{R_1}$ $I_{R2} = \frac{V_{R2}}{R_2}$
   replace comp. V with node V: $V_{R1} = V_{n1} - 0 = V_{n1}$
   $V_{R2} = V_{n1} - V_s$
   substitute: $I_{R1} = \frac{V_{n1}}{R_1}$ $I_{R2} = \frac{V_{n1} - V_s}{R_2}$
7. substitute comp. eq into KCL: $\frac{V_{n1}}{R_1} + \frac{V_{n1} - V_s}{R_2} = 0$
8. solve for unknown node voltages

$V_s = 5V$
V_{n1}
I_{R2} ↑ I_{R1} ↓
$I_{R1} + I_{R2} = 0$

$$V_{n1} = V_s \cdot \frac{R_1}{R_1 + R_2}$$

VOLTAGE DIVIDER

RESISTORS



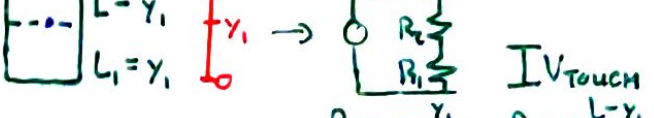
$$R = \rho \cdot \frac{L}{w\,t}$$
↳ resistivity [Ω·m]

TOUCH SCREEN

↳ this pixel is R

$$V_T = V_s \cdot \frac{R_1}{R_1 + R_2} = y_1/L \cdot V_s$$

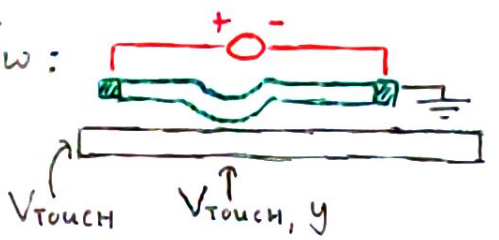
what is the voltage at •?



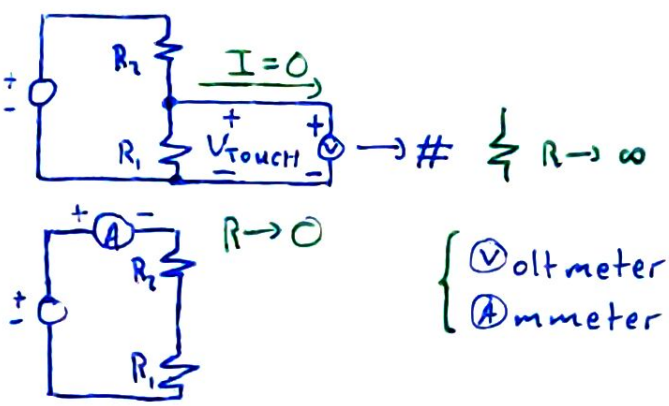
$R_1 = \rho \frac{y_1}{w\,t}$ $R_2 = \rho \frac{L - y_1}{w\,t}$

1D Touch

Side View:



Voltmeters/Ammeters



so as to not change the circuit dynamics

{ Ⓥoltmeter → open circuit
Ⓐmmeter → short circuit }