

Class 3: Voltage Dividers

Activity 3 – Voltage Dividers

January 20th, 2022

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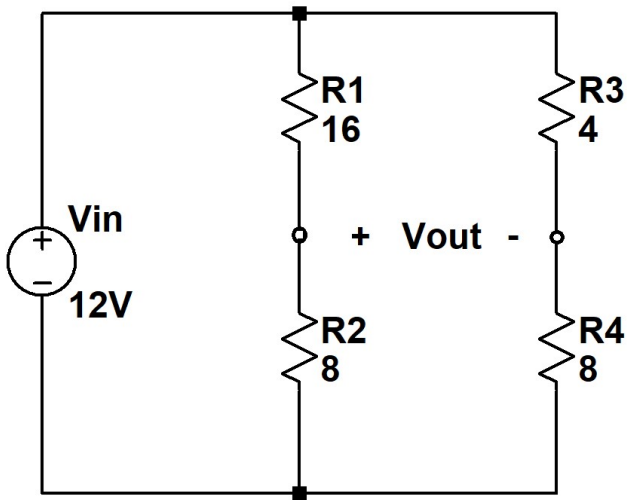
ECSE Department

Rensselaer Polytechnic Institute

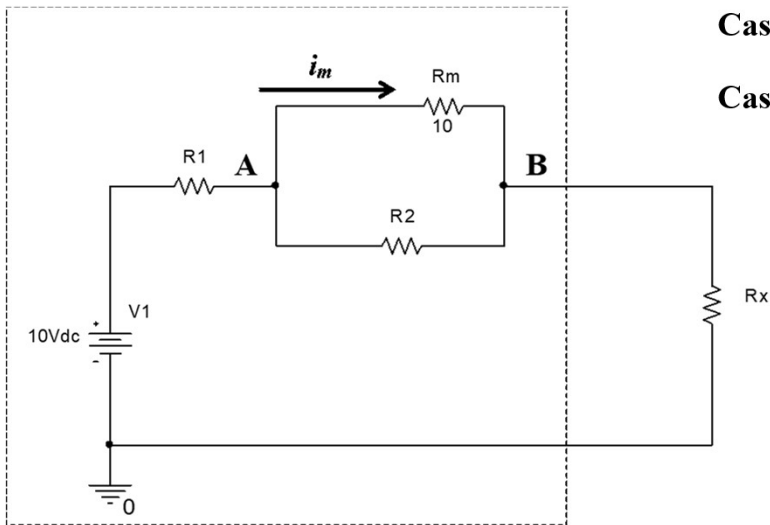
Intro to ECSE

Derivation of Voltage Divider Equation

Example: Find V_{out}



A bit more complicated example



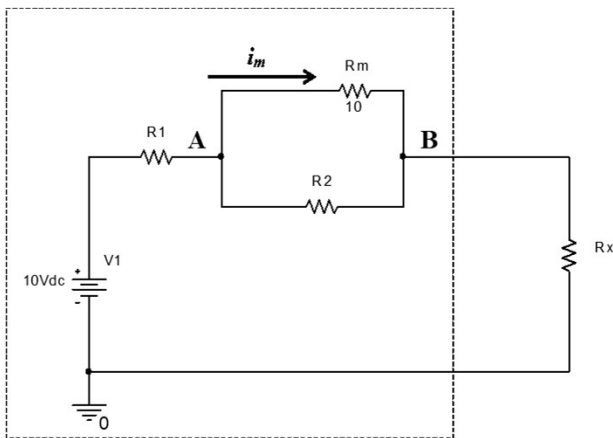
Case 1: Given that when $R_x = 0 \Omega$, the current through resistor R_m is 2 mA, i.e. $i_m = 2 \text{ mA}$.

Case 2: Given that when $R_x = 2000 \Omega$, the current through resistor R_m is 1 mA, i.e. $i_m = 1 \text{ mA}$.

Find voltage between points A and B for each of the cases described above

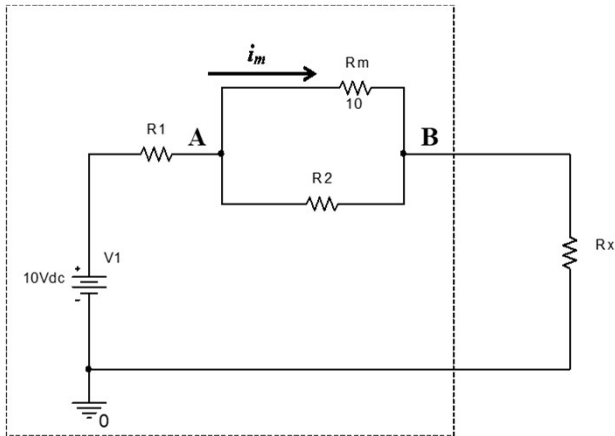
What is the equivalent resistance between points A and B, R_{AB} ?
(Express in terms of R_2)

A bit more complicated example (contd.)



Using voltage divider and your previous findings, develop a relationship between R1 and R2 for case 1

A bit more complicated example (contd.)



Using voltage divider and your answer to parts a and b, develop a relationship between R1 and R2 for case 2

A bit more complicated example (contd.)

- Solve the linear relationships derived previously, to determine the values of resistors R_1 and R_2 such that both case 1 and 2 are satisfied

What about Current Division?

Input Impedance of Voltmeter

Activity 3: Voltage Divider

- Go to the class website
- Look under class 3
- Find activity 3
- Do the activity
 - Individual submission for activity 3
 - Encouraged to discuss with others in the class on WebEx Teams
- Answer the activity using template (attached class 3)
- When complete – upload to Gradescope
 - Due Thursday, January 27th at 11:59 pm
 - Use guides to learn how to upload documents