WS1

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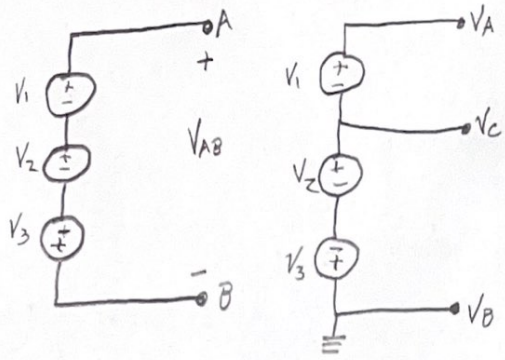
1)



$V_1 = 10V$
$V_2 = 5V$
$V_3 = 6V$

$V_B = 0V$

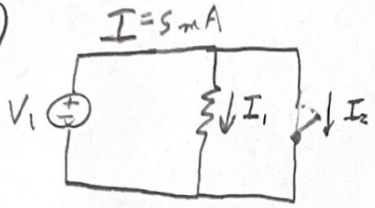
$V_C = -V_3 + V_2 = -6 + 5 = -1V$

$V_A = V_C + V_1 = -1 + 10 = 9V$

$V_{AB} = V_A - V_B = 9 - 0 = 9V$

$V_A = 9V$ $V_C = -1V$
$V_B = 0V$ $V_{AB} = 9V$

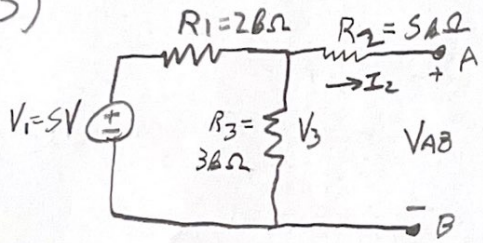
2)



a) open: $I_1 = 5mA$, $I_2 = 0mA$

b) closed: $I_2 = 0mA$, $I_2 = 5mA$

3)



$V_{AB} \parallel V_3 \therefore V_{AB} = V_3$

$I_2 = 0$ as open circuit

I_1 in series w/ $I_3 \therefore I_1 = I_3 = I$

$V_1 - IR_1 - IR_3 = 0 \Rightarrow V_1 = I(R_1 + R_3)$

$I = V_1/(R_1 + R_3) = 5V/(2B\Omega + 3B\Omega)$

$\Rightarrow I = 1mA$

$V_{AB} = V_3 = IR_3 = (1mA)(3B\Omega) = 3V \Rightarrow \boxed{V_{AB} = 3V}$

// voltage divider

$\Rightarrow V_{AB} = V_3 = \frac{R_3}{R_1 + R_3} V_1 = \frac{3B\Omega}{5B\Omega}(5V) = \boxed{3V = V_{AB}}$