EE3 Fall 2018 Nevin Liang

Practice Problems 2

1a) $I = \frac{V_1 - 12}{4}$ b/c $I = \frac{\Delta V}{R}$

1b) $I = \frac{V_1 - 0}{5}$ b/c $I = \frac{\Delta V}{R}$

1c) $I = \frac{V_1 - V_2}{2}$ b/c $I = \frac{\Delta V}{R}$

1d) $I_1 + I_2 + I_3 = 0$

$$\frac{V_1 - 12}{4} + \frac{V_1 - 0}{5} + \frac{V_1 - V_2}{2} = 0$$

1e) $I_1 = \frac{V_2 - V_1}{2}$, $I_2 = \frac{V_2 - 0}{1}$, $I_3 = \frac{V_2 - 0}{3+6}$

1f) $I_1 + I_2 + I_3 = \frac{V_2 - V_1}{2} + \frac{V_2}{1} + \frac{V_2}{9} = 0$

2) $5V_1 - 60 + 4V_1 + 10V_1 - 10V_2 = 0$

$$19V_1 - 10V_2 = 60$$

$$9V_2 - 9V_1 + 18V_2 + 2V_2 = 0$$

$$-9V_1 + 29V_2 = 0$$

$$V_1 = \frac{29}{9}V_2$$

$$\frac{551}{9}V_2 - 10V_2 = 60$$

$$\frac{461}{9}V_2 = 60 \qquad V_2 = \frac{540}{461} = \boxed{1.17\ V}$$

$$V_1 = \frac{1740}{461} = \boxed{3.774\ V}$$

3) $\frac{12 - V_1}{4} = I$

$I = 2.056\ A$