

Physics Traditional Circuit Practice I - Simplify & Solve

$I_1 = 2A$
 $V_2 = 20V$
 $V_3 = 12V$
 $V_5 = 0$
 $R_e = 2 + 4 + 6 = 12\Omega$
 $i_1 = V/R = 24/12 = 2A$
 $\Delta V_2 = iR = 2(2) = 4V$
 $V_2 = 24 - 4 = 20V$

$\Delta V_4 = iR = 2 \cdot 4 = 8$
 $V_3 = 20 - 8 = 12V$
 $\Delta V_6 = iR = 2 \cdot 6 = 12$
 $V_5 = 12 - 12 = 0$

$\frac{1}{R_e} = \frac{1}{1} + \frac{1}{3} + \frac{1}{9}$
 $\frac{1}{R_e} = 1.444$
 $R_e = \frac{1}{1.444} = 0.6923$

$I_1 = 173.3A$
 $I_2 = 120A$
 $I_3 = 40A$
 $I_4 = 13.3$
 $V_1 = 120V$
 $V_3 = 0V$

$I_1 = V/R = \frac{120}{0.6923}$
 $i_2 = V/R = \frac{120}{1}$
 $i_3 = V/R = 120/3$
 $i_4 = V/R = \frac{120}{9} = 13.3$

$\frac{1}{R_e} = \frac{1}{1} + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} = 1.775$
 $R_e = 1/1.775 = 0.533$

$I_1 = 18.95A$
 $I_2 = 10.1A$
 $I_3 = 5.05A$
 $I_4 = 2.53A$
 $I_5 = 1.26A$
 $V_1 = 48V$
 $V_3 = 29.05V$
 $V_4 = 18.95$

$\Delta V_1 = iR = 18.95 \cdot 1$
 $V_2 = 48 - 18.95 = 29.05V$
 $V_5 = 0$
 $\Delta V_4 = 29.05 - 18.95$
 $V_4 = 18.95$
 $I_2 = V/R = 10.1/1$
 $I_3 = V/R = 10.1/2$
 $I_4 = V/R = 10.1/4$
 $I_5 = V/R = 10.1/8$

$48V \rightarrow 2.533\Omega \quad I_1 = V/R = 48/2.533 = 18.95A$

Physics Traditional Circuit Practice II - Simplify & Solve

	$I_1 = \underline{0.143 A}$ $V_2 = \underline{1.29 V}$ $V_3 = \underline{0.43 V}$ $V_5 = \underline{0}$ $R_e = 12 + 6 + 3 = 21 \Omega$ $i_1 = V/R = 3/21 = .143 A$ $\Delta V_{12} = iR = .143(12) = 1.71$ $V_2 = 3 - 1.71 = 1.29$
	$I_1 = \underline{11 A}$ $I_2 = \underline{2 A}$ $I_3 = \underline{3 A}$ $I_4 = \underline{6 A}$ $V_1 = \underline{12 V}$ $V_3 = \underline{0 V}$
	$I_1 = \underline{0.900 A}$ $I_2 = \underline{.225 A}$ $I_3 = \underline{.225 A}$ $I_4 = \underline{.225 A}$ $I_5 = \underline{.225 A}$ $I_6 = \underline{.9 V}$ $V_3 = \underline{5.4 V}$ $V_4 = \underline{3.6 V}$

$$\Delta V_6 = iR = .143(6) = .857 V$$

$$V_3 = 1.29 - .86 = 0.43 V$$

$$I = V/R = 12/1.091 = 11 A$$

$$i_2 = V/R = 12/6 = 2 A$$

$$i_3 = V/R = 12/4 = 3 A$$

$$i_4 = V/R = 12/2 = 6 A$$

$$\Delta V_4 = iR = .9(4) = 3.6 V$$

$$V_2 = 9 - 3.6 = 5.4 V$$

$$V_4 = 3.6 V$$

$$\Delta V \text{ for parallel resistors is } 5.4 - 3.6 = 1.8 V$$

$$i_2 = V/R = 1.8/8 = .225$$

$$i_3 = i_4 = i_5 = .225$$