

$$R_{11} = \frac{1}{\frac{1}{35} + \frac{1}{46.857} + \frac{1}{12.667}} = 7.7605$$

$$R_{12} = \frac{1}{\frac{1}{36} + \frac{1}{22}} = 13.655 \quad \frac{1}{\frac{1}{13.655} + \frac{1}{22}} = 8.4255 + 21 = 29.4255$$

$$\frac{1}{\frac{1}{29.4255} + \frac{1}{43}} = 17.470$$

$$R_E = 7.7605 + 17.470 + 15 + 10 = 50.230 \Omega$$

$$I = \frac{V}{R} = \frac{140V}{50.230 \Omega} = 2.7872 A$$

$$V_{10} = IR = (2.7872A)(10\Omega) = 27.872$$

$$V_{11A} = IR = (2.7872A)(7.7605\Omega) = 21.630$$

$$V_{15} = IR = (2.7872A)(15) = 41.808$$

$$V_{11B} = IR = (2.7872A)(17.470\Omega) = 48.692$$

$$I_1 = \frac{V}{R} = \frac{21.630}{46.857} = .46162$$

$$I_4 = \frac{V}{R} = \frac{21.630}{12.667} = 1.707$$

$$I_9 = \frac{V}{R} = \frac{48.692}{43} = 1.1324$$

$$I_{10} = \frac{V}{R} = \frac{48.692}{29.4255} = 1.6547$$

$$V_2 = IR = (.46162)(40\Omega) = 18.4648V$$

$$V_6 = IR = (1.707)(6\Omega) = 10.242V$$

$$V_{11} = IR = (1.1324)(43\Omega) = 48.865V$$

$$V_{12} = IR = (1.6547)(21\Omega) = 34.749V$$

$$V_3 = IR = (1.707)(6.667) = 11.380V$$

$$V_5 = IR = (.46162)(6.857) = 3.1653V$$

$$V_4 = IR = \left(\frac{21.630V}{35\Omega}\right)(20\Omega) = 12.36V$$

$$I_2 = \frac{V}{R} = \frac{3.1653}{12\Omega} = .26377A$$

$$I_3 = \frac{V}{R} = \frac{3.1653}{16\Omega} = .1978A$$

$$\Rightarrow V_8 = I_{10} R_8 = (1.6547)(8.425) = 13.941V$$

$$I_5 = \frac{V_8}{R} = \frac{13.941V}{13.655} = 1.0209A$$

$$I_6 = \frac{V_8}{R} = \frac{13.941}{22\Omega} = .63368A$$

$$I_7 = \frac{V_8}{R} = \frac{13.941}{36} = .38725A$$

$$I_8 = \frac{V_8}{R} = \frac{13.941}{22} = .63368A$$

$$V_9 = I_8 R = (.63368)(10\Omega) = 6.3368V$$

$$V_{10} = I_8 R = (.63368)(12\Omega) = 7.6042V$$