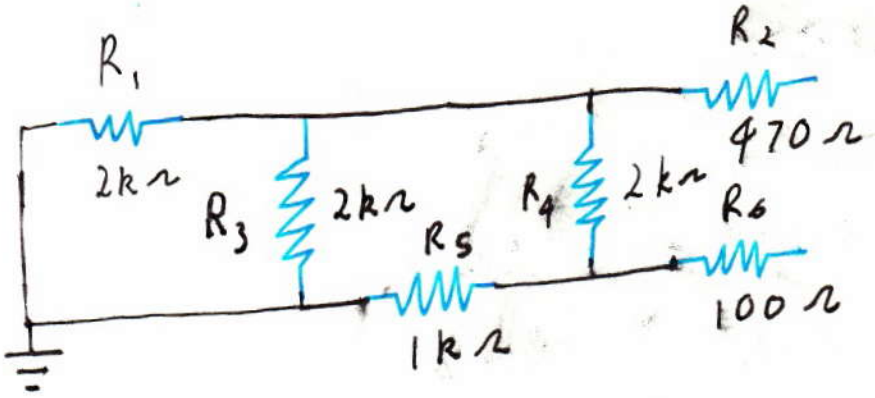
pre lab #6 CPE 1140 Bruce Liu



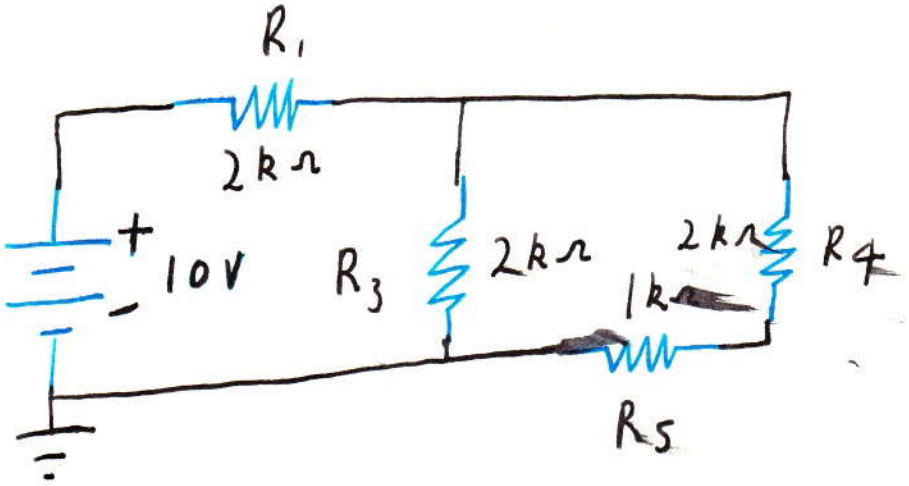
$R_1 \parallel R_3 = 1000\Omega$

$R_{(1\parallel3)} + R_5 = 2000\Omega$

$R_{(1\parallel3)+5} \parallel R_4 = 1000\Omega$

$R_{((1\parallel3)+5)\parallel4)} + R_2 + R_6 = 1570\Omega$

$R_{TH} = (R_{((1\parallel3)+5)\parallel4)} + R_2 + R_6) = \boxed{1570\Omega}$



$$R_4 + R_5 = 3000\ \Omega$$

$$R_{4+5} \parallel R_3 = 1200\ \Omega$$

$$V_{Target} = \frac{R_{Target}}{\Sigma R}$$

$$V_{R_3} = \frac{R_{(4+5)\parallel 3}}{R_{(4+5\parallel 3)} + R_1} V_S$$

$$V_{R_3} = \frac{1200}{1200+3000}\ 10$$

$$V_{R_3} = 3.75$$

$$V_{R4} = \frac{R_4}{R_4 + R_5} V_{R3}$$

$$V_{R4} = \left(\frac{2000}{2000 + 1000} \right) 3.75$$

$$V_{R4} = \frac{2}{3} \times 3.75 = 2.5\ V$$

$$V_{Th} = V_{R4} = \boxed{2.5\ V}$$

$V = iR$ $\quad \frac{V_{TH}}{R_{Load}} = i_{Load}$

$\frac{V}{R} = i$

R load value (Ω)	i_{load} (mA)	P_{load} (mw)
470.	5.319	13,297 mw
1000	2.500	6.25
1570	1.592	3.980
2700	0.925	a.314

$\frac{2.5}{470} = i_{Load\ 470\Omega} = 5.319\ mA$

$\frac{2.5}{1000} = i_{load\ 1000\Omega} = 2.500\ mA$

$\frac{2.5}{1570} = i_{Load\ 1570\Omega} = 1.592\ mA$

$\frac{2.5}{2700} = i_{load\ 2700\Omega} = 0.925\ mA$

$V = iR \qquad \frac{V}{R} = i$

$P = iV$

$P = \frac{V^2}{R}$

$\frac{(2.5)^2}{470} = P_{load\ 470\Omega} = 13.297\ mW$

$\frac{(2.5)^2}{1000} = P_{load\ 1000\Omega} = 6.25\ mW$

$\frac{(2.5)^2}{1570} = P_{load\ R_{th}} = 3.980 mW$

$\frac{(2.5)^2}{2700} = P_{load\ 2700} = 2.314\ mW$