Problem 1:

1. Draw the circuit you would use to find $R_T$.

2. Find the Thevenin equivalent resistance, $R_T$. Do not use $V_T = R_T I_N$.

3. Draw the circuit you would use to find $V_T$.

4. Find the Thevenin voltage. Do not use $V_T = R_T I_N$.

5. Draw the circuit you would use to find $I_N$.

6. Find the Norton current. Do not use $V_T = R_T I_N$.

7. What value of $R_L$ would transfer the maximum amount of power?

8. What amount of power would be transferred to the load?

Given:

$R_1 = 2 \Omega$, $R_2 = 2 \Omega$, $R_3 = 3 \Omega$
$R_M = 6 \Omega$, $V_S = 6 V$

$R_T = \left( \frac{R_1}{R_3} \right) + \left( \frac{R_2}{R_1} \right)$

$R_T = \left( \frac{R_1 R_2}{R_1 + R_2} \right) + \left( \frac{R_1 R_3}{R_1 + R_3} \right)$

$R_T = \frac{2 \times 3}{3} + \frac{2 \times 6}{6} = \frac{6}{3} + \frac{12}{6} = 2 + 2 = 4 \Omega$

$V_T = \frac{3 \times 6}{2 + 3} = \frac{18}{5} V$

$V_N = \frac{2 \times 6}{2 + 1} = \frac{12}{3} V$

$V_T = V_N = \frac{9}{10} V$

$P_{in} = \frac{V_T^2}{R_T}$

$P_{out} = \frac{V_T^2}{R_L}$

$P_{in} = \frac{V_T^2}{R_L}$