1. (23 pts) Find the values below. Show your work.

a) $R_3 =$ ?

b) $I_S =$ ?

c) $P_S =$ ?

Note: feel free to show answers & work right on the schematic.

2. (23 pts) Use the method of superposition to find $I_{R3}$ and $V_{R1}$.

Be sure to redraw the circuit as needed and to clearly show and circle your intermediate results.

3. (23 pts) a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is $R_L$.

b) Find and draw the Norton equivalent of the same circuit.

c) Find the load current using your Thévenin equivalent circuit.
4. (23 pts) Use nodal analysis to find the readings of the two ideal meters. You **MUST** show all the steps of nodal analysis work to get credit, including drawing appropriate symbols and labels on the circuit shown.

![Circuit Diagram](image)

5. (8 pts) Find $C_{eq}$ between terminals a and b.

![Circuit Diagram](image)

**Answers**

1. a) 100·Ω  
   b) 100·mA  
   c) 1125·mW  

2. $7.5\cdot mA + 2.5\cdot mA = 10\cdot mA$  
   $4.5\cdot V - 2.5\cdot V = 2\cdot V$

3. a)  
   ![Diagram](image)  

   b)  
   ![Diagram](image)  

   c) 22.5·mA  

4. 10.4·V  
   146.7·mA

5. 2.4·µF