Problem 1:

→ $R_{eq} = R_1 + R_2 + R_3$

$= 100 + 50 + 25$

$\boxed{R_{eq} = 175\,\Omega}$

→ $I = \frac{V_{in}}{R_{eq}} = \frac{120V}{175\,\Omega} = \boxed{0.69A}$

→ $P = V_{in} \cdot I = 120V \cdot 0.69A = \boxed{82.3W}$

→ $V_1 = I R_1 = 0.69A \cdot 100\,\Omega = \boxed{69V}$

$V_2 = I R_2 = 0.69A \cdot 50\,\Omega = \boxed{34.5V}$

$V_3 = I R_3 = 0.69A \cdot 25\,\Omega = \boxed{17.2V}$

BTW, check KVL $\Rightarrow V_1 + V_2 + V_3 = V_{in}$?

$69 + 34.5 + 17.2 = 120.7$ ≅ error due to rounding

Problem 2:

$$\rightarrow R_{eq} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}} = \frac{1}{\frac{7}{100}} = \boxed{14.3\,\Omega}$$

$$\rightarrow I = \frac{V_{in}}{R_{eq}} = \boxed{8.4A}$$

$$\rightarrow I_1 = \frac{V_{in}}{R_1} = \boxed{1.2A}$$

$$I_2 = \frac{V_{in}}{R_2} = \boxed{2.4A}$$

$$I_3 = \frac{V_{in}}{R_3} = \boxed{4.8A}$$

Check KCL $\Rightarrow I_1 + I_2 + I_3 = I$

$$1.2 + 2.4 + 4.8 = 8.4$$

Problem 3:

$\rightarrow R_{eq} = R_1 // (R_2 + R_3) = 100\,\Omega // (75\,\Omega)$ (50+25)

$$R_{eq} = \frac{1}{\frac{1}{100} + \frac{1}{75}} = \boxed{42.9\,\Omega}$$

$$\rightarrow I = \frac{V_{in}}{R_{eq}} = \boxed{2.8\,A}$$

$$\rightarrow I_2 = \frac{V_{in}}{(R_2 + R_3)} = \frac{120\,V}{75\,\Omega} = \boxed{1.6\,A}$$

$$V_2 = I_2 R_2 = 1.6\,A \cdot 50\,\Omega = \boxed{80\,V}$$

$$P_2 = I_2 V_2 = 1.6\,A \cdot 80\,V = \boxed{128\,W}$$

BTW, KVL holds because voltage across $R_3 = 40V$
(check if you want) and $V_2 + V_3 = V_{in}$

$40 + 80 = 120$

KCL holds because current through R_1 is 1.2 A
(again check if you want)

and $I_1 + I_2 = I$

$1.2A + 1.6A = \boxed{2.8A}$

Problem 4:

→ $R_{eq} = R_1 // R_2 + R_3 = \frac{1}{\frac{1}{100} + \frac{1}{50}} + 25$

$= \frac{100}{3} + 25 = \boxed{58.3\Omega}$

→ $I = \frac{V_{in}}{R_{eq}} = \frac{120V}{58.3\Omega} = \boxed{2.06A}$

→ First Find voltage across R_2.

Use KVL,

$V_{in} = V_2 + V_3 \Rightarrow V_2 = V_{in} - V_3$

~~Because~~ From KCL:

$I = I_1 + I_2$ Also $I_3 = I_1 + I_2$

so $I_3 = I$!

Then, $V_3 = IR_3 = 51.4V$

then $V_2 = 120V - 51.4V = \boxed{68.6V}$

$I_2 = \frac{V_2}{R_2} = \frac{68.6V}{50\Omega} = \boxed{1.37A}$

$P_2 = I_2 \cdot V_2 = \boxed{94W}$