Full credit:

\[ V_s = 1.2\,V \]
\[ R = 200\,\Omega \]
\[ I_s = -15\,mA \]
\[ V_R = 3\,V \]
\[ P_R = 45\,mW \]

\[ I_R = -I_s = 15\,mA \]
\[ V_R = I_R \times R = 15\,mA \times 200\,\Omega = 3\,V \]
\[ P_R = (I_R)^2 \times R = (15 \times 10^{-3})^2 \times 200 \]
\[ P_R = 0.045\,W = 45\,mW \]

Partial credit: No redrawn schematic

\[ V_s - V_R = 0 \rightarrow 1.2\,V - V_R = 0 \rightarrow V_R = 1.2\,V \]
\[ V_R = I_R \times R \rightarrow I_R = \frac{1.2}{200} = 0.006 = 6\,mA \]
\[ P_R = I_R \times V_R = 1.2\,V \times 6\,mA = 7.2\,mW \]

Low credit: No schematic

\[ V_s = 1.2\,V \]
\[ R = 200\,\Omega \]
\[ I_s = -15\,mA \]
\[ V_R = (0.15)(200) = 3\,V \]
\[ P_R = (3)(15) = 45\,mW \]
\[ I_R = 15\,mA \]

No explanation of why \( I_R = 16\,mA \), no explicit equations written down with variables and substitutions.

Ignored hint and assumed \( 0 \) voltage drop across current source

\( \checkmark \) used Ohm's law with clear variable names, but used incorrect current by not considering current source

\( \checkmark \) used Power's law with clear variable names, but wrong values

\( \checkmark \) These answers would be correct if there were no current source.

\( \checkmark \) It appears that the student understands Ohm's Law, Power's Law, and KVL, but doesn't understand current sources.
\[ R_A = 2R_2 \parallel 2R_2 = \frac{2R_2 \cdot 2R_2}{2R_2 + 2R_2} = \frac{4R_2^2}{4R_2} = R_2 \]

\[ R_B = R_2 + R_a = R_2 + R_2 = 2R_2 \]

\[ R_C = 2R_2 \parallel R_B = 2R_2 \parallel 2R_2 = R_2 \text{ (above calculation)} \]

\[ R_D = R_1 + R_C = R_1 + R_2 = 1\Omega + 8\Omega = 9\Omega \]

\[ I_S = \frac{V_S}{R_D} = \frac{5V}{9\Omega} = 0.556A \]

\[ V_1 = I_S \cdot R_1 = 0.556A \cdot 1\Omega \]

\[ V_1 = 0.556V \]
Partial Credit

schematic not redrawn; work is just written over assignment prompt

Correct, but no work shown

$$I_s = \frac{5V}{9\Omega} = 0.556 A$$

$$V_1 = I_s R_1 = 0.556 A \times 1\Omega$$

$$V_1 = 0.556 V$$

No explanation of where this equation comes from, what the 9\Omega is etc.

Low Credit

$$V = IR$$

$$I = \frac{V}{R} = \frac{5V}{8} = .625 A$$

$$V = IR = .625 \times 8 = 5 V$$

Incorrect value of R

No explanation of which I, V, R are being used in calculations.

Same variables are used for different components (V=5 and V=0.625,

**R = 8 and R=1**)

No clear explanation of resistor combination calculations, doesn't redraw full circuit, starts with 2 resistors already Combined