Answer for question #74326, Physics / Electric Circuits

Question: A 5.0 ohms and 20 ohms resistor are connected in the series. If the power dissipated in the 5.0 ohms resistor is 12.5 watts, what is the potential difference across the 20 ohm resistor?

Solution: First, we calculate current flowing though the resistor.

$$P_1 = I^2 \cdot R_1$$

$$I = \sqrt{\frac{P_1}{R_1}} = \sqrt{12.5/5} = 1.58\ (A)$$

Resistors are connected in series, so they have same current.

The potential difference across the 20 ohm resistor is:

$$U_2 = I \cdot R_2 = 1.58\ \cdot 20 = 31.6\ (V)$$

Answer: U_2 = 31.6 V