Consider the circuit shown at the right.

(a) How much current flows through the 20 Ω resistor?

\[ \text{loop 3: } 10V - i_4 (20 \Omega) = 0 \]
\[ i_4 = \frac{10V}{20\Omega} = 0.5A \]

(b) What is the voltage across the 7 Ω resistor?

\[ \text{loop 1: } 20V - i_2 7\Omega - i_2 3\Omega = 0 \]
\[ 20V = i_2 10\Omega \]
\[ i_2 = \frac{20V}{10\Omega} = 2A \]
\[ V = i_R R = 2A (7\Omega) = 14V \]

(c) How much current flow through the 20 V battery?

\[ \text{loop 2: } 20V - i_3 40\Omega - i_4 20\Omega = 0 \]
\[ i_3 40\Omega = 20V - i_4 20\Omega \]
\[ i_3 = \frac{20V - i_4 20\Omega}{40\Omega} = \frac{20V - 0.5A (20\Omega)}{40\Omega} = \frac{10V}{40\Omega} = 0.25A \]

(d) How much power is turned to heat by the 40 Ω resistor?

\[ P = i_3^2 R = (0.25A)^2 (40\Omega) = 2.5W \]