Consider the circuit shown in the diagram.

(a) How much current flows through the 12 Ω resistor?

around loop:

\[ +12 - 12i - 6 = 0 \]
\[ 6 = 12i \]
\[ i = 0.5 \text{ A} \]

(b) How much power is dissipated by the 24 Ω resistor?

\[ P = \frac{V^2}{R} = \frac{6^2}{24} = 1.5 \text{ W} \]
notice that 6 V is across the 24 Ω resistor

or \[ P = VI \]
\[ i = \frac{6}{24} = \frac{1}{4} \rightarrow P = 6 \left( \frac{1}{4} \right) = 1.5 \text{ W} \]

(c) Is energy supplied to or taken from (circle one) the 6 V battery and at what rate (i.e., calculate the power)?

3 Ω \( \leftarrow 1.5 \text{ A} \) (since there is 3 times the current across this as across the 12 Ω resistor it's in parallel with)

0.5 A \( \leftarrow \) \( \frac{1}{4} \) A \( \text{[from (a)]} \)

\( 2 \text{A flows in to } P \)
\( \text{i } = \frac{1.5}{1.25} \)
\( \text{i } = 1.2 \text{ A} \) A flows out

so \( i = 1.75 \text{ A} \)

1.75 A flows thru 6 V battery from \( + \) to \( - \)
so it supplies energy at the rate \( P = (6)(1.75) \)
\[ = 10.5 \text{ W} \]