In the circuit below the light bulbs all have the same resistance $R = 360 \Omega$. The voltage of the battery is 120V.

a) Rank the five light bulbs according to brightness, starting with the brightest.

$1 > (4) > (2) = (3) > (5)$

All of $I$ goes through 1.

No current goes through (5) (short circuit).

More current goes through (2) than through (3) + (4).

The same current goes through (3) as through (2).

b) What is the current in bulb 1?

\[
\begin{align*}
R_1 &= 360 \Omega \\
R_2 &= 360 \Omega \\
R_3 &= 360 \Omega \\
R_4 &= 360 \Omega \\
R_5 &= 360 \Omega \\
R_p &= 240 \Omega
\end{align*}
\]

\[
\begin{align*}
P &= \frac{I^2}{R} \\
P &= \frac{I^2}{R_1} + \frac{I^2}{R_2} + \frac{I^2}{R_3} + \frac{I^2}{R_4} + \frac{I^2}{R_5} = \frac{I^2}{R_p}
\end{align*}
\]

\[
I = \frac{V}{R} = \frac{120V}{600 \Omega} = 0.2A
\]

All goes through 1.

c) How much energy does the circuit draw each second?

\[
P = I \cdot V = (0.2A) (120V) = 24 W
\]

\[
\text{energy} = \text{power} \times \text{time} \\
1 \text{ sec} = 1 \frac{J}{W}
\]

\[
= (24W) (1s) = 24 J
\]