74. (a) From symmetry we see that the current through the top set of batteries (i) is the same as the current through the second set. This implies that the current through the $R = 4.0\,\Omega$ resistor at the bottom is $i_R = 2i$. Thus, with r denoting the internal resistance of each battery (equal to $4.0\,\Omega$) and $\mathcal{E}$ denoting the 20 V emf, we consider one loop equation (the outer loop), proceeding counterclockwise:

$$3\,(\mathcal{E} - ir) - (2i)R = 0\ .$$

This yields $i = 3.0$ A. Consequently, $i_R = 6.0$ A.

(b) The terminal voltage of each battery is $\mathcal{E} - ir = 8.0$ V.

(c) Using Eq. 28-14, we obtain $P = i\mathcal{E} = (3)(20) = 60$ W.

(d) Using Eq. 27-22, we have $P = i^2 r = 36$ W.