P 1.34

$$\begin{aligned} p_a &= v_a i_a = (120)(-10) = -1200 \text{ W}; \\ p_b &= -v_b i_b = -(120)(9) = -1080 \text{ W}; \\ p_c &= v_c i_c = (10)(10) = 100 \text{ W}; \\ p_d &= -v_d i_d = -(10)(-1) = 10 \text{ W}; \\ p_e &= v_e i_e = (-10)(-9) = 90 \text{ W}; \\ p_f &= -v_f i_f = -(-100)(5) = 500 \text{ W}; \\ p_g &= v_g i_g = (120)(4) = 480 \text{ W}; \\ p_h &= v_h i_h = (-220)(-5) = 1100 \text{ W}. \end{aligned}$$

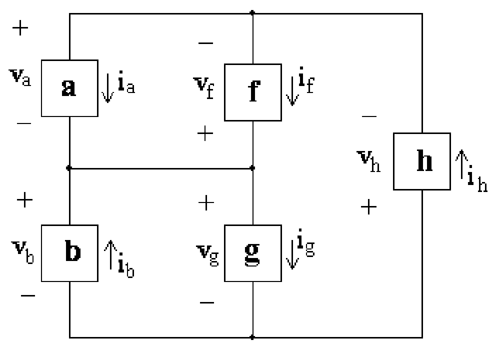
$\sum P_{del} = 1200 + 1080 = 2280$ W;

$\sum P_{abs} = 100 + 10 + 90 + 500 + 480 + 1100 = 2280$ W.

Therefore, $\sum P_{del} = \sum P_{abs} = 2280$ W.

Thus, the interconnection now satisfies the power check.

P 1.35 **[a]** The revised circuit model is shown below:



[b] The expression for the total power in this circuit is

$$v_a i_a - v_b i_b - v_f i_f + v_g i_g + v_h i_h$$

$$= (120)(-10) - (120)(10) - (-120)(3) + 120 i_g + (-240)(-7) = 0.$$

Therefore,

$$120 i_g = 1200 + 1200 - 360 - 1680 = 360$$

so

$$i_g = \frac{360}{120} = 3 \text{ A}.$$

Thus, if the power in the modified circuit is balanced the current in component g is 3 A.