Problem 1.17

Figure 1.28 shows a circuit with four elements, $p_1 = 60$ W absorbed, $p_3 = -145$ W absorbed, and $p_4 = 75$ W absorbed. How many watts does element 2 absorb?

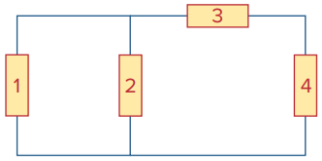

Figure 1.28
For Prob. 1.17.

Solution

By the law of conservation of energy, the total power absorbed in a circuit must be equal to the total power emitted at any time, that is,

$$\sum p = 0$$

$$p_1 + p_2 + p_3 + p_4 = 0$$

$$(60 \text{ W}) + p_2 + (-145 \text{ W}) + (75 \text{ W}) = 0.$$

Therefore, solving for p_2,

$$p_2 = 10 \text{ W}.$$