

1.35 Find  $V_x$  in the network in Fig. P1.35 using Tellegen's theorem.

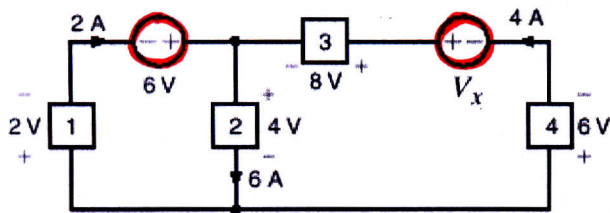


Figure P1.35

**SOLUTION:**

Power supplied = Power absorbed

$$P_{6V} + P_{V_x} = P_1 + P_2 + P_3 + P_4$$

$$P_1 = 2(2) = 4W \text{ absorbed}$$

$$P_2 = 4(6) = 24W \text{ absorbed}$$

$$P_3 = 8(4) = 32W \text{ absorbed}$$

$$P_4 = 6(4) = 24W \text{ absorbed}$$

$$P_{6V} = 6(-2) = -12W$$

$$P_{6V} = 12W \text{ supplied}$$

$$P_{6V} + P_{V_x} = P_1 + P_2 + P_3 + P_4$$

$$12 + P_{V_x} = 4 + 24 + 32 + 24$$

$$P_{V_x} = -4V_x$$

$$P_{V_x} = 4V_x \text{ supplied}$$

$$12 + 4V_x = 4 + 24 + 32 + 24$$

$$V_x = 18V$$