1.33 Find V_x in the network in Fig. P1.33 using Tellegen's theorem.

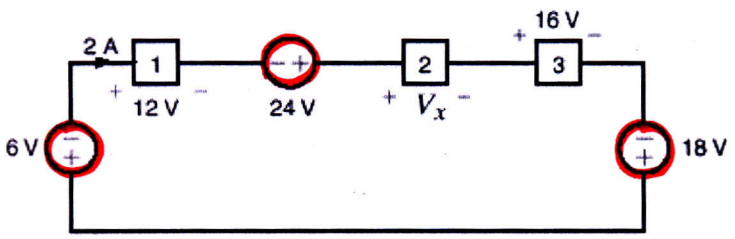

Figure P1.33

SOLUTION:

$P_1 = 12(2) = 24\text{W}$ absorbed

$P_2 = V_x(2) = 2V_x$ absorbed

$P_3 = 16(2) = 32\text{W}$ absorbed

$P_{6V} = 6(2) = 12\text{W}$ absorbed

$P_{24V} = 24(-2) = -48\text{W}$

$P_{24V} = 48\text{W}$ supplied

Power supplied = Power absorbed

$P_{24V} + P_{18V} = P_1 + P_2 + P_3$

$48 + 36 = 24 + 2V_x + 32$

$V_x = 8\text{V}$