Problem 1

Determine $P_{\text{absorbed}} = P_{\text{developed}}$

KCL Node a

$i_1 - 4A - 8A = 0$

$i_x = 4A$

$2i_x = 2(4A) = 8A$

$i_1 = 12A$

KVL (left, CW)

$-160V - 40V + v_2 = 0$

$\text{KVL (Perimeter, CW)}$

$-160V - v_1 = 0$

$v_2 = 200V$

$v_1 = -160V$
\[ P_{160\text{v}} = -VI = -(160\text{v})(12\text{A}) = -1920\text{W (developed)} \]
\[ P_{40\text{v}} = -VI = -(40\text{v})(4\text{A}) = -160\text{W (developed)} \]
\[ P_{4\text{A}} = VI = (200\text{v})(4\text{A}) = 800\text{W (absorbed)} \]
\[ P_{2\text{i}x} = -VI = -(160\text{v})(8\text{A}) = 1280\text{W (absorbed)} \]

\[ P_{\text{developed}} = 1920\text{W} + 160\text{W} = 2080\text{W} \]
\[ P_{\text{absorbed}} = 800\text{W} + 1280\text{W} = 2080\text{W} \]

\[ P_{\text{developed}} = P_{\text{absorbed}} \]