b)

KCL A: $\dfrac{3i_x - v_1}{2} + \dfrac{3i_x - v_2}{3} = 0$

$\quad\quad\quad\quad (3) \quad\quad\quad (2)$

$\Rightarrow 15 i_x - 3v_1 - 2v_2 = 0$

KCL C: $+1 + \dfrac{v_2 - 3i_x}{3} + \dfrac{v_2 - v_1}{4} = 0$

$\quad\quad\quad\quad\quad (4) \quad\quad\quad (3)$

$\Rightarrow -12 i_x - 3v_1 + 7v_2 = -12$

const: $i_x = \dfrac{v_1 - v_2}{4} \Rightarrow v_1 = 4i_x + v_2$

$\quad\quad\quad (8)$

$\Rightarrow \begin{cases} 3i_x - 5v_2 = 0 \\ -24 i_x + 4v_2 = -12 \end{cases} \quad -36 v_2 = -12 \Rightarrow v_2 = \dfrac{1}{3}$

$\Rightarrow R_{Th} = \dfrac{v_2}{1} = \dfrac{1}{3} \ \Omega$

c)
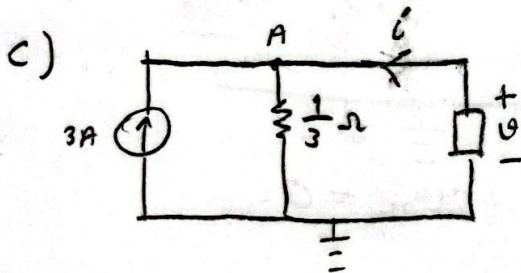
KCL A: $-3 + \dfrac{v}{\frac{1}{3}} - i = 0$

$\Rightarrow 3v + i = 3$

$3v + (v-4)^2 = 3 \quad\Rightarrow\quad v^2 - 11v + 19 = 0$

$\Delta = 121 - 76 = 45$

$v = \dfrac{11 + 3\sqrt{5}}{2} \quad\Rightarrow\quad i = (v-4)^2 = \left(\dfrac{3\sqrt{5}+3}{2}\right)^2 = \dfrac{54 + 18\sqrt{5}}{4} = \dfrac{27 + 9\sqrt{5}}{2}$

$P = vi = \dfrac{9}{4} \cdot (11 + 3\sqrt{5})(3 + \sqrt{5}) = \dfrac{9}{4}\left(48 + 20\sqrt{5}\right) = 108 + 45\sqrt{5} \ W$