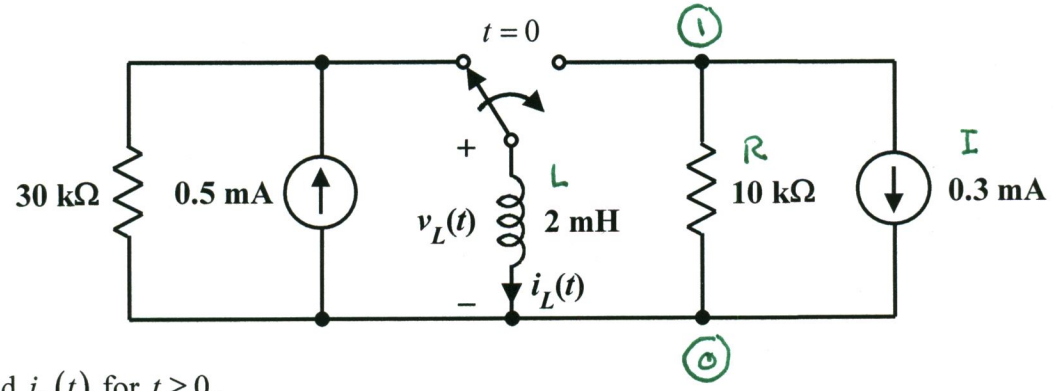
EE 2240

Problem #04

The switch has been in the position shown for a ***very*** long time.



a. Find $i_L(t)$ for $t \geq 0$.

$i_L(0) = 0.5\ mA$

$\tau = \frac{2\ mH}{10k\Omega} = 200\ ns$

$i_L(\infty) = -0.3\ mA$

$i_L(t) = [i_L(0) - i_L(\infty)]\, e^{-t/\tau} + i_L(\infty)$

$= [0.5 - (-0.3)]\, e^{-t/200\times10^{-9}} + (-0.3)\ mA$

$= 0.8\, e^{-5\times10^6 t} - 0.3\ mA,\quad t \geq 0$

b. Use PSpice and PROBE to plot the power delivered by the 0.3 mA independent current source for $0 \leq t \leq 1\,\mu s$.

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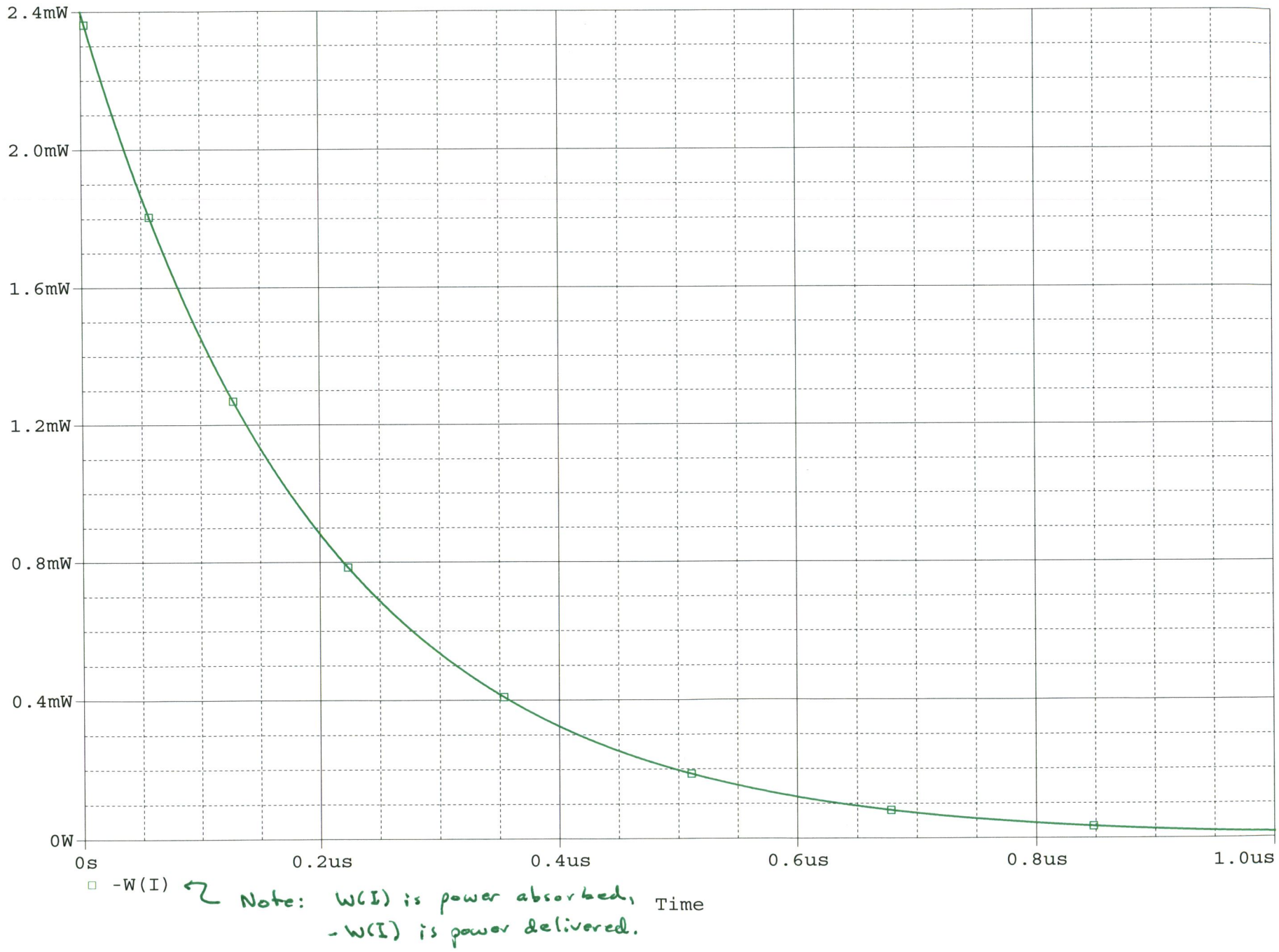
Problem #04
L  1  0  2m   IC = 0.5m
R  1  0  10k
I  1  0  DC  0.3m
.TRAN  1n  1u  0  1n  UIC
.PROBE
.END
```

5e = 1 μs

See the next page for the plot.

Problem #04



Note: W(I) is power absorbed,
-W(I) is power delivered.