Problem 1:

P1.1]

$\lambda = -1/dt \ln(1 - r/N)$

$\lambda_{\text{stroke mort}} = (-1)\ln(1 - 36.2/100{,}000) = 0.0003621$ //

$\lambda_{\text{ns mort}} = (-1)\ln(1 - 1763.8/100{,}000) = 0.01780$ //

$\lambda_{\text{ns mort}} = (18/1000 \cdot 100/100) - 36.2/100{,}000 = 1763.8/100{,}000$

P1.2]

$\lambda_{\text{1st stroke}} = (-1)\ln(1 - 15/1000) = 0.015114$ //

P1.3]

0.90 well → stroke

0.10 well → stroke dead

$0.90 = \lambda_1/(\lambda_1 + \lambda_2) = \lambda_1/0.015114$

$\lambda_1 = 0.01360$ //

$0.10 = \lambda_2/0.015114$

$\lambda_2 = 0.0015114$ //

P1.4]

$P_{5\text{y recur}} = 0.17 = r/N$

$\lambda_{\text{stroke recur}} = -1/5 \ln(1 - 0.17) = 0.037266$ //

P1.5]

0.80 post-stroke → stroke

0.20 post-stroke → stroke dead

$0.80 = \lambda_a/0.037266$

$\lambda_a = 0.02981$ //

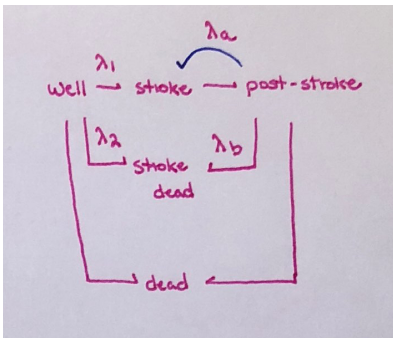
$0.20 = \lambda_b/0.037266$

$\lambda_b = 0.007453$ //

P1.6]

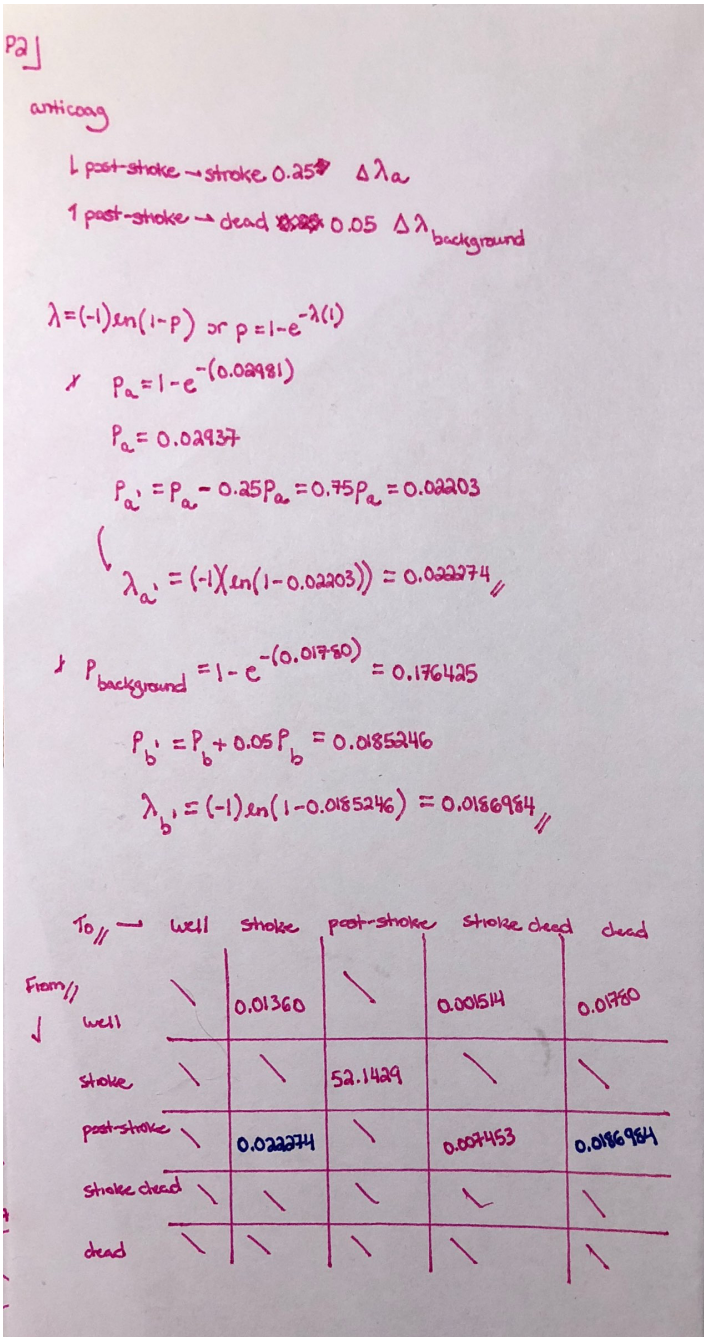
in stroke $1/52 = 0.019231 = 1/\lambda$

$\lambda = 52.1429$ //



To // → / From // ↓	well	stroke	post-stroke	stroke dead	dead
well	\	0.01360	\	0.0015114	0.01780
stroke	\	\	52.1429	\	\
post-stroke	\	0.02981	\	0.007453	0.01780
stroke dead	\	\	\	\	\
dead	\	\	\	\	\

Problem 2:



P2]

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↳ post-stroke → stroke 0.25 $\Delta\lambda_a$

↑ post-stroke → dead 0.05 $\Delta\lambda_{background}$

$\lambda = (-1)\ln(1-p)$ or $p = 1-e^{-\lambda(1)}$

$P_a = 1-e^{-(0.02981)}$

$P_a = 0.02937$

$P_a' = P_a - 0.25P_a = 0.75P_a = 0.02203$

$\lambda_a' = (-1)(\ln(1-0.02203)) = 0.022274$

$P_{background} = 1-e^{-(0.01750)} = 0.176425$

$P_b' = P_b + 0.05P_b = 0.0185246$

$\lambda_b' = (-1)\ln(1-0.0185246) = 0.0186984$

From \ To	well	stroke	post-stroke	stroke dead	dead
well	\	0.01360	\	0.001514	0.01750
stroke	\	\	52.1429	\	\
post-stroke	\	0.022274	\	0.004453	0.0186984
stroke dead	\	\	\	\	\
dead	\	\	\	\	\