Read the portion of my second study guide on Bayes Analysis prior to the McElreath textbook.

1, page 6:
1 - Z is sometimes referred to as the "complement of credibility".
Confusingly, often instead what I have denoted Y, the item that is given weight 1 - Z, is referred to as the "complement of credibility".
Tse in Nonlife Actuarial Models: Theory Methods and Evaluation does not use the term "complement of credibility". Weight 1 - Z is given to M = manual rate.

2, page 208, last line: = **0.4259**.

2, page 306, 5th line from the bottom: $(300)^2(0.21)$

3, solution 5.1: $f(x) = \{(a+b-1)! / (a-1)!\ (b-1)!\}\ (x/\theta)^{a-1}\{1 - (x/\boldsymbol{\theta})\}^{b-1} / \theta =$

3, page 275, solutions 8.16 and 8.17 are missing:

8.16. E. A Gamma-Exponential with prior Gamma with $\alpha = 1$ and $\theta = 1/100$.
Thus the posterior Gamma has parameters $\alpha = 1 + 2 = 3$, and $1/\theta = 100 + 40 + 80 = 220$.
$E[1/\lambda]$ = negative first moment of the posterior Gamma = 220/(3-1) = **110**.
Alternately, the posterior distribution is proportional to: $e^{-100\lambda}\lambda e^{-40\lambda}\ \lambda e^{-80\lambda} = \lambda^2 e^{-220\lambda}$.
$E[X \mid \lambda] = 1/\lambda$. Therefore, the expected size of the next claim is:

$$\frac{\int_0^\infty (1/\lambda)\ \lambda^2\ e^{-220\lambda}\ d\lambda}{\int_0^\infty \lambda^2\ e^{-220\lambda}\ d\lambda} = \frac{220^{-2}\ \Gamma(2)}{220^{-3}\ \Gamma(3)} = 220/2 = \mathbf{110}.$$

Comment: Since $\alpha = 1 \le 2$, one can not apply Buhlmann Credibility.
The posterior mixed distribution is Pareto with $\alpha = 3$ and $\theta = 220$, with mean 220/(3-1) = 110.

8.17. D. A Gamma-Exponential.
Thus the posterior Gamma has parameters $\alpha = 4 + 3 = 7$,
and $1/\theta = 1000 + 100 + 200 + 500 = 1800$.
$E[1/\lambda]$ = negative first moment of the posterior Gamma = 1800/(7-1) = **300**.
Alternately, $K = \alpha - 1 = 4 - 1 = 3$. $Z = (3/(3+K) = 3/(3+3) = 50\%$.
The prior mean is the negative first moment of the prior Gamma = 1000/(4-1) =1000/3.
Estimate of the future severity is: (50%)(800/3) + (50%)(1000/3) = **300**.
Comment: The posterior mixed distribution is Pareto with $\alpha = 7$ and $\theta = 1800$,
with mean 1800/(7-1) = 300.

5, Q. 2.10: Model III: K-Nearest Neighbors with K = **5**.

5, solution. 8.16: Final solution is okay.
Z_1 and Z_3 are uncorrelated. It turns out that constraining Z_3 to be uncorrelated with Z_1 is equivalent to constraining the direction ϕ_3 to be orthogonal (perpendicular) to the direction ϕ_1. Thus, $\sum_{j=1}^{5} \varphi_{j1} \varphi_{j3} = 0$. Thus Statement III is true.

Comment: Z_1, Z_2, and Z_3 are each orthogonal to the others.