Errata and updates for ASM Exam C/Exam 4 Manual (Twelfth Edition) sorted by page

Note the corrections for practice exam 2:19 (page 1132) and 7:33.

[10/5/2011] On page xv, at the end of the first line of the paragraph of the first bullet, add the word "include".

[11/7/2010] On page 9, in Theorem 2, change $\sum_i \Pr(B_i)=1$ to $\Pr(\cup_i B_i)=1$.

[11/7/2010] On page 14, in Law of Total Probability second line, change $\sum_i \Pr(B_i)=1$ to $\Pr(\cup_i B_i)=1$.

[9/27/2011] On page 20, in the solution to exercise 1.6, on the first displayed line, change $\mathbf{E}[X+Y]^3$ to $\mathbf{E}[(X+Y)^3]$.

[10/5/2011] On page 28, on the second displayed line of the answer to Example 2B, in the exponent, delete one of the "/"'s.

[9/27/2011] On page 29, on the second line of Example 2E, replace x with X.

[8/5/2011] On page 32, replace the second sentence of Subsection 2.3.4 with

If Y is exponential with mean μ, then $X=Y^{1/\tau}$ is Weibull with parameters $\theta=\mu^{1/\tau}$ and τ.

[9/27/2011] On page 38, on the second line of the page, replace $r(x)$ with $r(\theta)$.

[11/10/2010] On page 51, in the first two displayed equations, the x_i in parenthesis should be x.

[1/25/2012] On page 54, one line above equation (*), change $\int_0^x a(x)\mathrm{d}x$ to $\int_0^x a(t)\mathrm{d}t$.

[10/28/2010] On page 62, in exercise 4.7, on the last line, add the word "of" after "coefficient".

[10/17/2011] On page 69, in the solution to exercise 4.10, on the first line, change $a(x)=x$ to $a(x)=2x$.

[12/3/2010] On page 70, in the solution to exercise 4.13, on the 6th line, change the exponent α to $-\alpha$.

[1/24/2012] On page 83, in the solution to exercise 5.5, on the third line, change "begin" to "being".

[10/28/2010] On page 83, in the solution to exercise 5.6, change $X\wedge 1000$ to $X\wedge 5000$.

[2/8/2011] On page 87, on the first line of the third paragraph, change "then" to "than".

[10/29/2010] On page 95, on the first line, two lines overprinted. The first line should be "**6.7-6.8** (Repeated for convenience)" and the second line should be "Use the following information for questions 6.7 and 6.8."

[1/24/2011] On page 117, in exercise 7.4(iii), replace "at 500" with "at the deductible".

[11/13/2010] On page 122, in the solution to exercise 7.4, the left hand side of the displayed line is incorrect. Replace the displayed line with

$$\begin{aligned}\mathbf{E}[X\wedge d] &= \mathbf{E}[X\wedge d \mid X<d]\Pr(X<d)+\mathbf{E}[X\wedge d \mid X\geq d]\Pr(X\geq d)\\ &= (\text{Average loss}<d)\Pr(X<d)+d\Pr(X\geq d)\\ &= 500(0.6)+d(0.4)\end{aligned}$$

[10/5/2011] On page 125, in the solution to exercise 7.13, on the third line, change the period after the first "doubled" to a comma.

[5/1/2011] On page 138, second line from bottom of page, some parentheses are missing. The line should read

$$= \mathbf{E}[X]\left(\frac{1-\Phi\left(\frac{\ln\left(\exp(\mu+z_p\sigma)\right)-\mu-\sigma^2}{\sigma}\right)}{1-p}\right)$$

[11/16/2010] On page 140, in the third paragraph of Section 8.4, first sentence, in "The following are", delete "are".

[12/31/2011] On page 147, in the solution to exercise 8.5, replace the eighth line with

Dividing by $1-p=0.1$, we get 974.567, which is the mean excess loss. Then adding $1000\sqrt{0.9}$ to 974.567, we get that $\text{TVaR}_{0.90}(X)=$ **1923.25**.

[5/16/2011] On page 168, in the solution to exercise 9.17, 3 lines from the end, delete "given that it".

[4/8/2011] On page 174, 3 lines from the end of exercise 10.1, change "contact" to "contract".

[8/26/2011] On page 200, in the solution to exercise 11.25, on the last line, 0.9298775 should be 0.929775.

[11/3/2010] On page 218, in exercise 13.13(i), add the words "in 2010" after "above 100".

[1/3/2012] On page 260, in the solution to exercise 15.9, on the first line of the paragraph beginning "Strictly speaking", delete the words "a multiple of" before "96".

[10/16/2011] On page 265, in the solution to exercise 15.27, 5 lines from the end, change 213.3443 to 213.4334.

[11/8/2010] On page 296, in the solution to exercise 17.24, at the end of the first line, add (after "than") "or equal to".

[2/15/2011] On page 302, on the last line, change m_0^1 to m_1^0.

[1/28/2012] On page 314, in the solution to exercise 18.18, on the second line, change "are" to "is".

[4/24/2011] On page 327, in equation (19.3), remove the hat on $v(\theta)$.

[12/15/2011] On page 330, in exercise 19.5 item 2, change "form" to "from".

[9/27/2011] On page 348, 3 lines above equation (21.3), delete one of the periods after "constant".

[3/28/2011] On page 355, in the solution to exercise 21.7, change the denominators in the first two displayed lines from 130^3 to 130^2. The third displayed line should be replaced with

$$=\frac{130\left(\frac{78}{130}\right)\left(\frac{52}{130}\right)+(0.5^2)(130)\left(\frac{20}{130}\right)\left(\frac{110}{130}\right)-(2)(0.5)(130)\left(\frac{78}{130}\right)\left(\frac{20}{130}\right)}{130^2}$$

On the second to last line, change the last $+$ in the numerator to $-$.

[10/6/2011] On page 356, in the solution to exercise 21.11, on the second line, replace "$m=\theta$ and $q=n=50$" with "$m=n=50$ and $q=\theta$".

[11/11/2010] On page 359, on the last line of the last bullet, change "amount" to "time".

[11/27/2010] On page 362, in the first table, in the heading, replace $y_j \le t \le y_{j+1}$ with $y_j \le t < y_{j+1}$.

[3/4/2011] On page 376, in the solution to exercise'22.8, on the first displayed line, change $n-t+1$ to $n-i+1$.

[7/22/2011] On page 384, 2 lines from the bottom of the second paragraph, remove the right parenthesis after 0.6. On the last line of the paragraph, add "'is" between (8000, 10,000) and (0.1)(0.4).

[9/27/2011] On page 386, one line below the first two displayed lines, remove the right parenthesis after Nelson-Åalen.

[7/24/2011] On page 392, in exercise 23.4, on the line after the table, add a period after "interval".

[11/26/2010] On page 401, in the answer to Example 24C, 3 line from the end, change 0.004618 to 0.0004618.

[2/27/2011] On page 424, two lines above Figure 25.7, change $\hat{f}(11.6)$ to $\hat{k}(11.6)$.

[4/12/2011] On page 447, in the third paragraph's first line, change "starting at c_{j-1} and ending at c_j]] to "'starting at c_j and ending at c_{j+1}".

[12/1/2010] On page 448, on the 7th line, change "an including" to "and including".

[4/12/2011] On page 451, on the fourth line of the answer to Example 26C, change P_{j-1} to P_j.

[9/27/2011] On page 452, in the first line of the answer to Example 26D, change "ar" to "are".

[7/24/2011] On page 453, on the last line of the page, change $(100-75)$ to $(100-25)$.

[4/12/2011] On page 458, in the solution to exercise 26.6, in the table's header, change c_{j-1} to c_j and P_{j-1} to P_j.

[2/11/2011] On page 491, on the first displayed line of the page, change $y_{(n+1)p}$ to $x_{(n+1)p}$.

[10/15/2010] On page 494, on the second to last line of Example 28E, change α to τ.

[4/11/2011] On page 534, on the seventh line of the page, change "Let'e" to "Let's".

[5/25/2011] On page 542, on the first line of Example 30H, change 300 to 261.

[11/19/2010] On page 551, in exercise 30.21(iii), add "follow a" after "to".

[1/12/2011] On page 564, in the solution to exercise 30.25, on the fifth line, remove the negative sign in front of $\frac{2}{\theta^3}$.

[10/16/2010] On page 574, in the solution to Quiz 30-2, on the last line, add a negative sign to the denominator: -3.02990.

[12/5/2010] On page 579, 3 and 4 lines from the bottom, change $L(\theta)$ and $l(\theta)$ to $L(\alpha)$ and $l(\alpha)$. On page 580 on the first displayed line, change $L(\alpha)$ to $L(\theta)$.

[3/17/2011] On page 580, on the third displayed line of the paragraph "Lognormal distribution", remove the minus sign before $\frac{\sum(\ln x_i-\mu)}{\sigma^2}$.

[11/9/2011] On page 632, on the first line of the solution to Quiz 32-1, delete "it".

[7/27/2011] On page 649, on the heading row, fifth column of the table, $F(c_j)$ should be $F^*(c_j)$.

[10/29/2010] On page 651, on the first line, two lines overprinted. The first line should be "**34.3-34.4** (Repeated for convenience)" and the second line should be "Use the following information for questions 34.3 and 34.4."

[2/5/2011] On page 661, the solution to exercise 34.16 is incomplete. Add at the end:

With 5 observations, we compare the Kolmogorov-Smirnov statistic 0.2355 with $1.22/\sqrt{5}$ and see that it is lower, hence the answer is **(A)**. However, as mentioned in the text, the critical value should be lowered due to censored data.

[7/28/2011] On page 670, 4 lines from the end of the solution to exercise 35.1, remove the inner square on $F_n(1)$: make it $\left(F_n(1)\right)^2$.

[7/28/2011] On page 670, on the first displayed line of the solution to exercise 35.2, remove the inner square from $F_n(0.05)$; make it $\left(F_n(0.5)\right)^2$.

[2/15/2011] On page 672, in the solution to exercise 35.8, on the last line, change 0.9048 to 0.9046 and change the final answer to 4.1976.

[10/19/2010] On page 707, in the solution to Quiz 36-1, on the third line, change $1-e^{-0.25}$ to $1-e^{-4}$.

[4/17/2011] On page 711, in the answer to Example 37B, on the third displayed line, change the denominator to $25^{1.5}$.

[9/27/2011] On page 712, on the last displayed line of the page, remove one of the two consecutive negative signs after the equals sign, and change 1.31 to 13.1.

[8/22/2011] On page 721, in the solution to exercise 37.12, three lines from the end, change "2 free parameters in H_0" to "no free parameters in H_0".

[12/11/2010] On page 729, one line after the numbered list, delete the words "of number".

[11/23/2010] On page 742, in the solution to exercise 38.14, on the first line, n_0 should be n_F.

[1/1/2012] On page 743, in the solution to exercise 38.18, on the last line, change n_0^2 to n_0.

[7/29/2011] On page 748, on the displayed line in the answer to Example 39A, replace n_0 with n_F.

[11/17/2011] On page 759, in Quiz 40-1, replace "are given" with "give".

[2/12/2011] On page 796, in the solution to exercise 41.25, change the final answer 0.7312 to 0.7311 in two places, and change 0.2688 on the last line of the table to 0.2689.

[11/29/2010] On page 803, in equation (42.2), replace (in the integrand) $f(x_1,\ldots,x_n \mid \theta)$ with $f(x_{n+1} \mid \theta)$.

[2/14/2011] On page 806, on the first line of the answer to Example 42C, change 0.0064 to 1/0.2176.

[2/14/2011] On page 810, on the second line of the answer to Example 42F, the final exponent is missing a θ: $e^{-0.305\theta}$.

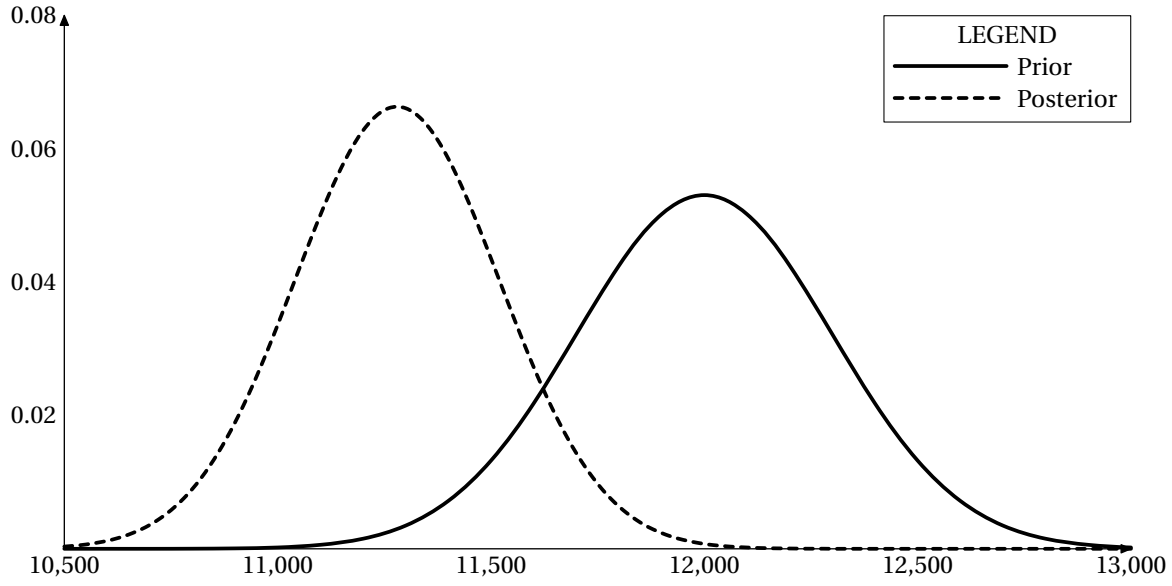
[2/14/2011] On page 819, in the solution to exercise 42.3, on the third line, add a 4 to the first exponent in the numerator: $-\lambda e^{-4\lambda}$.

[10/23/2010] On page 822, in the solution to exercise 42.9, on the second displayed line of the page, the middle and right-hand side should be $\frac{2\pi}{\pi} - 2\left(\frac{2}{\pi}\right) = 2 - \frac{4}{\pi}$. On the third displayed line, the denominator should be $2 - 4/\pi$.

[2/16/2011] On page 825, in the solution to exercise 42.17, on the last line, change 0.5^10 to 0.5^{10}.

[9/27/2011] On page 846, in the second sentence of the second paragraph, delete the "e" after the word "the".

[12/16/2010] On page 846, Figure 44.1 should be replaced with this:



[2/19/2011] On page 851, on the last line of the solution to exercise 44.8, $1797.03 - 1500$ should be $1500 - 1797.03$.

[12/18/2010] On page 856, on the fourth line of Example 45C, replace all three x's with p's so that it reads

$$\pi(p) = 6p(1-p) \quad 0 \le p \le 1$$

[2/26/2011] On page 861, in the solution to exercise 45.12, on the second line, change $a+*$ to a_*.

[12/23/2010] On page 934, there are several errors in the answer to Example 49B. The correct answer is

The hypothetical mean of the compound distribution is the product of the means of claim counts and claim sizes. The mean of the geometric is $\beta = 0.1$ and the mean of the Pareto is $\theta/(\alpha-1) = \Theta/2$, so the hypothetical mean is 0.05Θ. The variance of the hypothetical mean is

$$\begin{aligned} a &= 0.05^2 \operatorname{Var}(\Theta) \\ &= 0.05^2 \left(\theta^2 \Gamma(1+2/\tau) - \left(\theta \Gamma(1+1/\tau) \right)^2 \right) \\ &= 0.05^2 \left(10^2 \Gamma(9) - 10^2 \Gamma(5)^2 \right) = 0.05^2 (3{,}974{,}400) = 9936 \end{aligned}$$

The process variance, by the compound variance formula, is

$$\begin{aligned} v(\Theta) &= \mathbf{E}[N] \operatorname{Var}(X) + \operatorname{Var}(N) \mathbf{E}[X]^2 \\ &= \beta \left(\frac{2\Theta^2}{2} - \left(\frac{\Theta}{2} \right)^2 \right) + \beta(1+\beta) \left(\frac{\Theta}{2} \right)^2 \\ &= 0.1(0.75)\Theta^2 + 0.11(0.25\Theta^2) = 0.1025\Theta^2 \end{aligned}$$

The expected value of the process variance is

$$\begin{aligned} v &= 0.1025 \mathbf{E}[\Theta^2] \\ &= 0.1025 \theta^2 (1+2/\tau) \\ &= 0.1025(100)\Gamma(9) = 413{,}280 \end{aligned}$$

The Bühlmann k is $413{,}280/9936 = \boxed{\mathbf{41.5942}}$.

[12/23/2010] On pages 935–936, there are several errors in the answer to Example 49D. The correct answer is

The hypothetical mean is $R\beta\alpha\theta/(\alpha-1) = (R)(4)(100R)/3 = (400/3)R^2$. The variance of the hypothetical means is

$$\begin{aligned} a &= \operatorname{Var}\left(\frac{400}{3} R^2 \right) = \left(\frac{400}{3} \right)^2 \left(\mathbf{E}[R^4] - \mathbf{E}[R^2]^2 \right) \\ &= \frac{160{,}000}{9} \left(\int_1^3 \frac{r^4 \, dr}{2} - \left(2^2 + \frac{2^2}{12} \right)^2 \right) \\ &= \frac{160{,}000}{9} \left(\frac{3^5 - 1^5}{10} - \left(\frac{13}{3} \right)^2 \right) \\ &= \frac{160{,}000}{9} \left(24.2 - \frac{169}{9} \right) = 96{,}395.062 \end{aligned}$$

The process variance is

$$\begin{aligned} v(R) &= \mathbf{E}[N \mid R] \operatorname{Var}(X \mid R) + \operatorname{Var}(N \mid R) \mathbf{E}[X \mid R]^2 \\ &= R \left(\frac{4(100R)^2}{2} - \left(\frac{4(100R)}{3} \right)^2 \right) + 2R \left(\frac{4(100R)}{3} \right)^2 \\ &= \frac{20{,}000}{9} R^3 + \frac{320{,}000}{9} R^3 = \frac{340{,}000}{9} R^3 \end{aligned}$$

The expected value of the process variance is evaluated by integrating r^3 times the uniform density $1/2$.

$$v = \frac{340{,}000}{9}\int_1^3 \frac{r^3 \mathrm{d}r}{2} = \left(\frac{340{,}000}{9}\right)\left(\frac{3^4-1^4}{8}\right) = 377{,}777\tfrac{7}{9}$$

The Bühlmann k is $377{,}777\frac{7}{9}/96395.062 = \boxed{\mathbf{3.9191}}$.

[5/1/2011] On page 936, on the second line of the paragraph under "Priors Requiring Integration", change "were be" to "would be".

[12/23/2010] On page 937, on the last three displayed lines in the answer to Example 49E, -7.291167 is missing. Replace those lines and the last line with

$$\begin{aligned} v &= 0.2\int_5^{10}\theta^2\int_3^5\left(-\frac{1}{\alpha-1}+\frac{1}{\alpha-2}\right)\mathrm{d}\alpha\,\mathrm{d}\theta - 7.291167 \\ &= 0.2(\ln 3-\ln 2)\int_5^{10}\theta^2\mathrm{d}\theta - 7.291167 \\ &= 0.2\ln 1.5\left(\frac{10^3-5^3}{3}\right) - 7.291167 = 16.3610 \end{aligned}$$

The Bühlmann k is $16.3610/0.535296 = \boxed{\mathbf{30.56}}$.

[11/30/2011] On page 954, in the solution to exercise 49.19, replace all ten q_{35}'s with Q's.

[3/4/2011] On page'958, in the solution to exercise 49.32, on the fourth displayed line, replace Var with **E**:

$$\mathbf{E}\left[\frac{2{,}000{,}000}{m}\right]$$

[1/3/2011] On page 958, make the following corrections to the solution to exercise 49.33:

- On the first line, change the process variance to $e^{2\mu+2\sigma^2}-(e^{\mu+0.5\sigma^2})^2 = e^{2\mu}(e^8-e^4)$.
- Replace the sixth line with
$$v = \mathbf{E}[e^{2\mu}(e^8-e^4)] = (e^8-e^4)\mathbf{E}[e^{2\mu}]$$
- Replace the last two lines with
$$\begin{aligned} v &= (5/3)(e^8-e^4) \\ k &= \frac{(5/3)(e^8-e^4)}{(5/48)e^4} = \boxed{\mathbf{857.57}} \end{aligned}$$

[8/5/2011] On page 981, on the second line of the solution to exercise 51.2, delete two "n"'s in Bühlmannnn.

[1/19/2011] On page 986, in the first line of the answer to Example 52A, change "tht" to "that".

[12/27/2010] On page 997, on the first line of the last bullet, change n to n_i.

[10/10/2010] On page 1006, 6 lines above Subsection 53.2.2, change $\left(\frac{1}{0.05}\right)$ to (0.05).

[10/26/2010] On page 1012, in exercise 53.17, two lines under the table, change m_j to m_i.

[3/21/2011] On page‘1020, in the solution to exercise 53.11, two lines from the end, change 0.983272 to 0.938272.

[1/4/2012] On page 1022, in the solution to exercise 53.15, the final answer should be $\boxed{\mathbf{0.5115}}$.

[3/23/2011] On page 1046, in the solution to exercise 54.13, replace the last displayed line with

$$\hat{a} = (3-2)^2 + (1-2)^2 - \frac{2}{3} = \frac{4}{3}$$

[10/31/2010] On page 1055, on the line between the first two tables, delete “would” after “rule”.

[8/6/2011] On page 1057, in exercise 55.5, on the last line of the table, replace n with m.

[1/19/2011] On page 1066, in the solution to exercise 55.8, on the first line, change “and 4” to “and 1”.

[1/12/2011] On page 1074, 7 lines from the bottom, change $100p$th to 100πth.

[6/10/2011] On page 1078, in exercise 56.1, the last column of the table is obviously inconsistent with the previous column, and the S_i^2 column is inconsistent with the previous column. This question was adapted from the sample exam, but the t column had to be changed due to a change in the Ross textbook when it was on the syllabus, and the result was an inconsistent table. To fix the question, replace the table and the paragraph preceding the table with:

You want to be 95% certain that your estimate will not differ from the true value by more than 0.01 units. Your estimates of profitability, X_i, for the first 120 policies reviewed, together with the indicated statistics, are shown below.

i	X_i	$\bar{X}_i$	S_i^2	S_i	$S_i/\sqrt{i}$
1	1.0795	1.0795			
2	1.0559	1.0677	0.00027908	0.0167	0.011813
3	1.1062	1.0806	0.00063266	0.0252	0.014522
⋮	⋮	⋮	⋮	⋮	⋮
100	1.0066	1.0787	0.00269721	0.0519	0.005193
101	1.1691	1.0796	0.00275115	0.0525	0.005219
102	1.0834	1.0796	0.00272405	0.0522	0.005168
103	1.1272	1.0801	0.00271931	0.0521	0.005138
104	1.0722	1.0800	0.00269351	0.0519	0.005089
105	1.1373	1.0806	0.00269886	0.0520	0.005070
106	1.0428	1.0802	0.00268661	0.0518	0.005034
107	1.0759	1.0802	0.00266144	0.0516	0.004987
108	1.1418	1.0807	0.00267174	0.0517	0.004974
109	1.1249	1.0811	0.00266489	0.0516	0.004945
110	1.2350	1.0825	0.00285565	0.0534	0.005095
111	1.0478	1.0822	0.00284056	0.0533	0.005059
112	1.0875	1.0823	0.00281522	0.0531	0.005014
113	1.1149	1.0826	0.00279950	0.0529	0.004977
114	1.1591	1.0832	0.00282611	0.0532	0.004979
115	1.0226	1.0827	0.00283329	0.0532	0.004964
116	0.9668	1.0817	0.00292447	0.0541	0.005021
117	1.1487	1.0823	0.00293761	0.0542	0.005011
118	1.1887	1.0832	0.00300848	0.0548	0.005049
119	1.1303	1.0836	0.00300164	0.0548	0.005022
120	1.0484	1.0833	0.00298673	0.0547	0.004989

[6/10/2011] On page 1081, consistent with the change to the exercise, change the solution to exercise 56.1 to

Your objective is met when the 1.96 times the standard deviation (estimated by the last column, $S_i/\sqrt{i}$) is less than or equal to 0.01, or

$$\frac{S_i}{\sqrt{i}} \le \frac{0.01}{1.96} = 0.005102$$

(Technically speaking we need a t coefficient rather than 1.96, but the difference is small for large i.) $i =$ **104** is the first time that this happens.

[11/4/2010] On page 1088, on the sixth line, add the following sentence before "However":

Since $\text{TVaR}_q(X)$ is the *mean* of the upper tail of the distribution, we might think that all we need to do is divide s_q^2 by n, the same way we estimate the variance of the sample mean.

On the seventh line, replace s_q^2 with s_q^2/n.

[12/5/2010] On page 1109, in Table 58.2, 6 lines from the end, replace "and are equal to" with "so".

[5/24/2011] On page 1109, in the answer to Example 58F, the final answer should be $29\frac{1}{3}$ instead of $29\frac{2}{3}$.

[5/10/2011] On page 1124, in question 21, on the first and third lines (once apiece), change "psuedorandom" to "pseudorandom".

[6/16/2011] On page 1132, in question 19, on the second line, change "varies by exposure" to "varies by group".

[5/10/2011] On page 1133, in question 20, on the second line, change "psuedorandom" to "pseudorandom".

[11/27/2010] On page 1136, in question 34:

1. On the second line, delete the words "per claim".
2. Change the last line to "Calculate the square root of the simulated unbiased sample variance of the annual reimbursement".

[5/10/2011] On page 1148, in question 6, on the second line, change "psuedorandom" to "pseudorandom".

[11/28/2010] On page 1154, on the second line of question 30, change "not less be" to "not be less".

[11/29/2010] On page 1159, in question 15, change the last four lines to:

Two different assumptions are used to estimate S(60):

(i) $\hat{S}(60)$ is the estimate if all new entries and withdrawals occur at interval boundaries.
(ii) $\tilde{S}(60)$ is the estimate if all new entries and withdrawals occur uniformly throughout the interval.

Calculate $|\hat{S}(60)-\tilde{S}(60)|$.

[2/15/2011] On page 1169, in question 22, on the displayed line, replace $f(\theta)$ with $f(x)$.

[11/30/2010] On page 1182, in question 33, on the line below the table, change "average payment per loss" to "average payment per payment".

[12/1/2010] On page 1187, in question 9, add the word "Annual" before the first sentence: "Annual claim counts…", and delete "Annual" from the second sentence.

[5/10/2011] On page 1198, in question 12, on the first line, change "psuedorandom" to "pseudorandom".

[5/10/2011] On page 1208, in question 11, on the second line, change "psuedorandom" to "pseudorandom".

[1/15/2011] On page 1238, in the solution to question 32, on the fourth displayed line, change $F_{Y_1}(y_1)$ to $S_{Y_1}(y_1)$.

[11/27/2010] On page 1239, in the solution to question 34, change "The unbiased standard deviation" to "The square root of the unbiased sample variance".

[3/4/2011] On page 1268, on the last line of the solution to question 13, change the two M's to $\hat{\theta}$'s.

[11/29/2010] On page 1269, in the solution to question 15, 2 lines from the end, change $\hat{S}(60)$ to $\tilde{S}(60)$.

[1/27/2012] On page 1272, in the solution to question 28, on the first line, change $1-q'^{10}$ to $(1-q')^{10}$. On the fourth line, change $0.1q$ to $0.1v$.

[11/29/2010] On page 1275, in the solution to question 35, on the third line from the end, change CV_s to CV_s^2.

[11/29/2010] On page 1277, in the solution to question 3, the final answer should be 0.3348.

[11/30/2010] On page 1298, the solution to question 33 should indicate that all survival functions and probabilities are conditional on $X>500$. A revised solution follows:

It is a little confusing that payment amounts rather than loss amounts are given.

Let X be the loss random variable. Considering payments from all three coverages, we have

y_i	r_i	s_i	$\hat{S}_X(y_i \mid X>500)$	$\Pr(X=y_i \mid X>500)$
1500	10	1	0.9	0.1
3000	9	2	0.7	0.2
3500	7	1	0.6	0.1
5000	6	3	0.3	0.3

The last column, $\Pr(X=y_i)$, is computed as differences of the survival functions. For example,

$$\Pr(X=3000)=\Pr(X\geq 3000)-\Pr(X>3000)=S_X(3000^- \mid X>500)-S_X(3000 \mid X>500)=0.9-0.7=0.2$$

Notice that the survival function can only be computed conditional on the loss being greater than 500, since there is no data for losses below 500.

Let Y^P be the average payment on the first coverage, which has a deductible of 500 and a maximum covered loss of 5000. The average payment is the sum of the probabilities times the amounts of the payments, taking into account that the payment is 4500 for any loss above 3500 (since such a loss is always 5000 or higher):

$$\begin{aligned}\mathbf{E}[Y^P] &= \sum_{x<3500}(x-500)\Pr(X=x \mid X>500)+4500S(3500 \mid X>500)\\ &= 0.1(1000)+0.2(2500)+0.1(3000)+0.6(4500)=\boxed{\mathbf{3600}} \qquad \textbf{(D)}\end{aligned}$$

Alternatively, you can integrate the survival function from 500 to 5000:

$$\begin{aligned}\mathbf{E}[Y^P] &= \int_{500}^{5000} S_X(x \mid X>500)\mathrm{d}x\\ &= \int_{500}^{1500} 1\,\mathrm{d}x+\int_{1500}^{3000} 0.9\,\mathrm{d}x+\int_{3000}^{3500} 0.7\,\mathrm{d}x+\int_{3500}^{5000} 0.6\,\mathrm{d}x\\ &= 1000+0.9(1500)+0.7(500)+0.6(1500)=\boxed{\mathbf{3600}}\end{aligned}$$

[10/25/2011] On page 1301, the solution to question 4 is incorrect. The correct solution is

A payment of 2500 for the first coverage is equivalent to a loss of 3000. The likelihood of 3000, or the density of a loss of 3000 is

$$f(3000)=\frac{2(2000^2)}{5000^3}=6.4\times 10^{-5}$$

A payment of 2500 for the second coverage is equivalent to a loss of 3500. The likelihood of 3500, or the density of a loss of 3500 given that it is greater than 1000 is

$$f(3500)=\frac{2(2000^2)}{5500^3}=4.80841\times 10^{-5}$$

The question is asking for the average size of the next payment, so it is asking for the average payment per payment, or the mean excess loss. For a Pareto, the mean excess loss at d, by equation **??**, is $e(d)=(\theta+d)/(\alpha-1)$. Thus, for a deductible of 500, the mean excess loss is $(2000+500)/1=2500$, and for a deductible of 1000 the mean excess loss is $(2000+1000)/1=3000$. We weight these by the product of the prior (2/3 vs. 1/3) and the likelihoods. The expected claim given a payment of 2500 is then

$$\frac{(2/3)(6.4\times 10^{-5})(2500)+(1/3)(4.80841\times 10^{-5})(3000)}{(2/3)(6.4\times 10^{-5})+(1/3)(4.80841\times 10^{-5})}=\boxed{\mathbf{2636.54}} \qquad \textbf{(A)}$$

[2/15/2011] On page 1301, in the solution to question 5, K is defined as negative what is shown in the solution, or -6.7709. Then $\hat{\alpha}=-n/K$, so it would still have the same value as shown in the solution.

[12/1/2010] On page 1303, in the solution to question 11, in the table's first column, change 65 to 75.

[12/1/2010] On page 1304, in the solution to question 12, on the first displayed line, move the first 0 into the upper limit of the integral:

$$\int_0^{10} x\left(\frac{x-6}{16}\right)$$

[2/23/2011] On pages 1309–1310, in the solution to question 29, on the first displayed line, $2\sigma^2$ should be in the exponent as follows:

$$\frac{1}{\sigma x\sqrt{2\pi}}e^{-(\ln x-\mu)^2/2\sigma^2}$$

On the first line of page‘1310, a summation sign is missing under the radical: $\sqrt{\sum(\ln x_i-2)^2/5}$.

[9/27/2011] On page 1310, in the solution to question 31, on the second line, change the z^2 in the numerator to z.

[10/9/2011] On page 1335, in the solution to question 22, on the fourth line, reverse 10.5 and 11.5 on the left side: $\mathbf{E}[(S-10.5)_+]-\mathbf{E}[(S-11.5)_+]$

[11/4/2010] On page 1351, on the 3rd line of the page, the bias is $-1/11\theta$, not $-1/\theta$.

[10/10/2010] On page 1362, in the solution to question 16, on the last line of the page, add a factor n_0 before $\frac{N-P}{P}$.

[1/3/2012] On page 1363, in the solution to question 16, on the second line of the page, reverse the inequality sign: $N \leq \frac{n_0P}{n_0-P}$.

[6/23/2011] On page 1384, in the solution to question 33, two lines after the itemized list, replace "$a=10,\ldots 10\left(\frac{9}{9+11}\right)=$ **5.50** " with "$a=12$, $b=10$, and mode $10\left(\frac{11}{11+9}\right)=$ **5.50** ".

[3/4/2011] On page 1384, in the solution to question 34, on the second line, after "distribution mean", add "squared".

[1/21/2012] On page 1385, in the solution to question 34, on the second line, remove the negative sign in $\frac{-1500}{x^2}$.

[6/20/2011] On page 1400, the table omits the correspondence of questions 283–289. They correspond to questions M-F06: 22,29,30,31,32,39, and 40 respectively, whose solutions are found on pages 1375–1376.