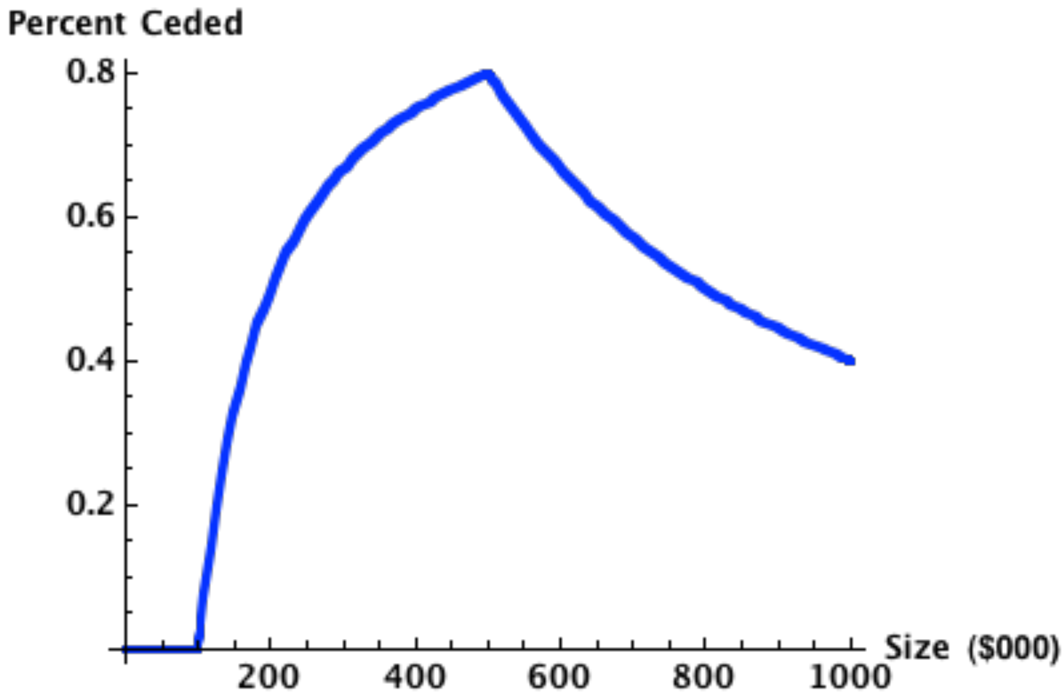
page 720, my graph is wrong. The correct graph:



For this example of a surplus share treaty, the amount ceded is:

$$\begin{cases} 0, \text{ for value} < 100{,}000 \\ (\text{value} - 100{,}000) / \text{value, for } 100{,}000 \le \text{value} \le 500{,}000 \\ 400{,}000 / \text{value, for value} > 500{,}000 \end{cases}$$

page 1393, end of solution 11.13:
The D-ratio is the ratio of expected primary losses to expected losses.
Average severity will be going up for this class; thus the D-Ratios should **de**crease.
However, there will be a lag due to the delay in data being available to be used to determine D-ratios. Thus the D-ratios for this class used in experience will be too **high**.
Assume for example, a risk with $20,000 in primary losses and $80,000 in excess losses.
Assume this is equal to the expected losses, but due to a too high D-Ratio the expected primary losses are $22,000, and the expected excess losses are $78,000.
$M = 1 + Z_p (20 - 22)/100 + Z_e (80 - 78)/100 = 1 - 0.02 (Z_p - Z_e)$.
Then due the fact that primary credibilities are greater than excess credibilities, this mod will be less than one. This misestimating of D-Ratios will on average **de**crease mods somewhat.

Page 1625:

Size Group	Number of Claims in Interval	Dollars of Loss in the Interval ($000)
0 to 250	2754	329
251 to 500	1878	686
501 to 750	1320	813
751 to 1000	959	829
1001 to 1500	1145	1399
1501 to 2000	657	1134
2001 to 3000	704	1713
3001 to 4000	270	925
4001 to 5000	137	608
5001 to 7500	112	667
7501 to 10,000	31	265
over 10,000	33	436
Total	**10,000**	9804

Page 2054, Q. 16.15: a minimum premium of $**5**00,000

Page 2084, solution 16.27, the minimum and maximum premiums should have included a factor of the tax multiplier of 1.03:
Minimum Premium = (1.03) {39,700 + (1.08)(100,000)} = **$152,131**.
Maximum Premium = (1.03) { 39,700 + (1.08)(400,000)} = **$485,851**.

Page 2144, Q. 17.48: Rewrite to give the State Tax Multiplier as 1.126.

Page 2153, sol. 17.4: Rule 1F only applies if we have a class containing a non-rateable catastrophe element. Thus we should should include min[100,000, 50K + 40K + 30K] = 100,000 from the three person accident. Revised solution:

17.4. Manual Premium = (10 million / 100)($4) + (5 million / 100)($0.5) = $425,000.
Standard Premium = (0.9)($425,000) = $382,500.
Maximum Premium = (175%)($382,500) = $669,375.
The sum in the three person accident exceeds the $100,000 accident limit; limit it 100,000.
Total limited losses = 94,600 + 10,000 + 25,000 + 75,000 + 100,000 + 100,000 = 404,600.
Converted Losses = (1.1)($404,600) = $445,060.
Basic Premium = (0.25)($382,500) = $95,625.
Excess Loss Premium = (1.1)(0.15)($382,500) = $63,113.
Retrospective Premium = (1.05)($445,060 + $95,625 + $63,113) = **$633,988**.
<u>Comment</u>: Similar to 5, 5/03, Q.42. *The expense constant is not subject to either experience or retrospective rating. If there were a $200 expense constant, then the insured would pay the retrospective premium plus $200. The expense loading included in the basic premium, already incorporates the effects of any premium discounts.*
If there had been one more large loss for $100,000, then the calculated retrospective premium would have been limited to the maximum premium of $669,375.
A retrospective rating accident limit is the same whether one or more persons are injured in an accident. In this question, the $100,000 limit applies to the total loss that enters the plan from a single accident, whether the accident involved 1 person, 2 persons, or more.

Pages 2412 to 2448, many solutions in section 20 are misnumbered:
20.13 ⇔20.15, 20.12⇔20.16, 20.13⇔20.17, 20.14⇔20.18, 20.15⇔20.19, ..., 20.34⇔20.38

Pages 1696-1697 have a number of mistakes. See the following corrected version.

In general, the dollars from those losses of size between a and b is:
$E[X \wedge b] - b\ S(b) - \{E[X \wedge a] - a\ S(a)\}$.

Thus, the average size of loss for those losses of size between a and b is:

$$\frac{\{E[X \wedge b] - b\ S(b)\} - \{E[X \wedge a] - a\ S(a)\}}{F(b) - F(a)}.$$

The numerator is the dollars per loss contributed by the losses of size a to b =
(contribution of losses of size 0 to b) minus (contribution of losses of size 0 to a).
The denominator is the percent of losses of size a to b =
(percent of losses of size 0 to b) minus (percent of losses of size 0 to a).

In the previous exercise, the average size of those losses of size 250 to 750 are:
146.8 / (0.7788 - 0.4724) = 479.

For a \$250 diminishing deductible disappearing at \$750, for a medium sized loss the insurer pays: $(X - 250)\left(\frac{750}{750 - 250}\right) = 1.5\ X - 375$.

The amount eliminated are: X - (1.5 X - 375) = 375 - 0.5X.
Thus in the previous exercises, the dollars eliminated from medium size losses is:
(375)(0.7788 - 0.4724) - (0.5)(146.8) = 41.5.

In general, for diminishing deductible, for a medium sized loss the insurer pays: $(X - d)\left(\frac{D}{D - d}\right)$.

Thus the amount eliminated is: $X - (X - d)\left(\frac{D}{D - d}\right) = \frac{d\ D}{D - d} - X\ \frac{d}{D - d}$.

The dollars from those losses of size between d and D is: $E[X \wedge D] - D\ S(D) - \{E[X \wedge d] - d\ S(d)\}$.
Thus the total losses eliminated from medium sized claims are:

$$\frac{d\ D}{D - d}\{F(D) - F(d)\} - \frac{d}{D - d}\ (E[X \wedge D] - D\ S(D) - \{E[X \wedge d] - d\ S(d)\}).$$

The insurer pays nothing for small losses of size less than 250, eliminating all of the dollars of loss. Thus the total losses eliminated from small sized claims is: $E[X \wedge 250] - 250\ S(250)$.
In this example, $E[X \wedge 250] - 250\ S(250) = 221.2 - (250)(0.7788) = 26.5$
In general, the total losses eliminated from small sized claims are: $E[X \wedge d] - d\ S(d)$.

The insurer pays everything on all of the large losses of size at least 750.
Thus no dollars are eliminated from large losses.

Thus in this example, the total losses eliminated are: 26.5 + 41.5 + 0 = 68,
which matches a previous result subject to rounding.[1]

[1] In a previous exercise: 26.50 + 41.47 = 67.97.

In general, adding up the results, the losses eliminated by a disappearing deductible are:[2]

$$E[X \wedge d] - d\,S(d) + \frac{d\,D}{D - d}\{F(D) - F(d)\} - \frac{d}{D - d}\ \{E[X \wedge D] - D\,S(D) - E[X \wedge d] + d\,S(d)\} =$$

$$E[X \wedge d] - d\,S(d) + \frac{d\,D}{D - d}\ \{F(D) + S(D)\} - \frac{d}{D - d}\{DF(d) + dS(d))\} + \frac{d}{D - d}\ (E[X \wedge d] - E[X \wedge D]\} =$$

$$-d\,S(d) + \frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D] + \frac{d\,D}{D - d}\ - \frac{d}{D - d}\{DF(d) + d - dF(d))\} =$$

$$-d\,S(d) + \frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D] + \frac{d\,D}{D - d}\ - \frac{d^2}{D - d}\ - dF(d) =$$

$$-d\,S(d) + \frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D] + d - dF(d) = \frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D].$$

For example, in the previous example, with d = 250 and D = 750:

$$\frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D] = (750/500)(221.2) - (250/500)(527.6) = 68,$$

matching the previous result.

For this example, a straight deductible of size 250 eliminates losses of: $E[X \wedge 250] = 221.2$.
A franchise deductible of size 250 eliminates losses of:
$E[X \wedge 250] - 250\,S(250) = 221.2 - (250)(0.7788) = 26.5$.

For a straight deductible the losses eliminated are: $E[X \wedge d]$.
For a franchise deductible, the losses eliminated are: $E[X \wedge d] - d\,S(d)$.[3]

Compare a straight deductible of size d, a franchise deductible of size d, and a diminishing deductible of size d that disappears at D. The straight deductible eliminates the largest percent of losses, the franchise deductible the smallest percentage, and the diminishing deductible a percentage between the other two.[4]

Exercise: You are given the following values for a size of loss distribution:
$E[X \wedge 1000] = 993$. $E[X \wedge 5000] = 4628$. $E[X \wedge 100{,}000] = 36{,}797$.
There is a basic policy limit of 100,000
Determine the loss elimination ratio for a 1000 disappearing deductible disappearing at 5000.
[Solution: The losses eliminated are:

$$\frac{D}{D - d}\ E[X \wedge d] - \frac{d}{D - d}\ E[X \wedge D] = (5000/4000)(993) - (1000/4000)(4628) = 84.25.$$

Loss Elimination Ratio = 84.25 / 36,797 = 0.23%.]

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[2] Personally, I would <u>not</u> memorize this formula.

[3] The franchise deductible only eliminates all of the dollars on claims of size less than d.
Thus compared to the ordinary deductible, the franchise deductible does not eliminate d from each large claim.

[4] See Table 6.7 in Bahnemann.