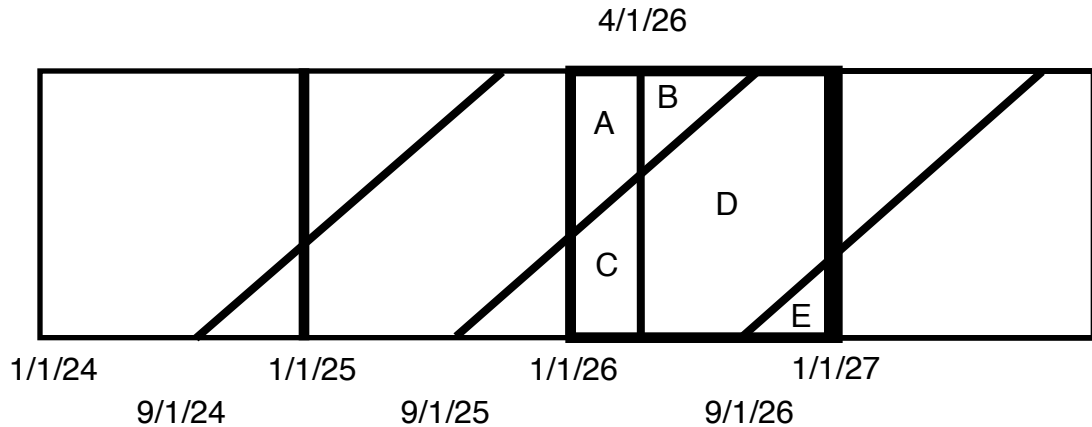


Basic Ratemaking, Solution 5.48:

The rate changes are represented by lines with slope 1, since the policies are annual.
The law amendment, since it applies to all in force policies, is represented by a vertical line.



Area Label	Area	Rate Level Index	Product
A	0.135417	1.06	0.143542
B	0.086806	0.954	0.082813
C	0.114583	1.1554	0.132390
D	0.607639	1.03986	0.631859
E	0.055556	1.081454	0.060081
Total	1.000000		1.050684

Area C is a trapezoid with width $1/4$ and average height: $(1/2)(4/12 + 7/12) = 11/24$.

Thus Area C = $(1/4)(11/24) = 11/96$.

Area A + Area C = $1/4$. $\Rightarrow$ Area A = $1/4 - 11/96 = 13/96$.

Area B = $(1/2)(5/12)(5/12) = 0.086806$. Area E = $(1/2)(4/12)(4/12) = 1/18$.

Area D = $3/4 - \text{Area B} - \text{Area E} = 0.607639$.

Rate Level A = 1.06. Rate Level B = $(1.06)(0.9) = 0.954$.

Rate Level C = $(1.06)(1.09) = 1.1554$. Rate Level D = $(1.06)(1.09)(0.9) = 1.03986$.

Rate Level E = $(1.06)(1.09)(0.9)(1.04) = 1.081454$.

The current rate level is 1.081454. The average rate level for CY2026 EP is: 1.050684.

On-level factor: $1.081454/1.050684 = \mathbf{1.0293}$.

Basic Reserving, Q. 16.12:

Accident Year	Calendar Year 2024 Paid Claims Only (\$000)
2021	400
2022	1800
2023	1900
2024	3000

Basic Reserving, Solution 17.2:

Year	CY Paid ULAE	CY Paid Claims	AY IBNR	AY Reported Claims	AY Ultimate Claims	Claims Basis	ULAE Ratio
2021	\$6,500	\$41,000	\$7,000	\$101,300	\$108,300	\$81,380	7.99%
2022	\$9,200	\$58,300	\$18,100	\$138,400	\$156,500	\$117,220	7.85%
2023	\$11,000	\$86,000	\$32,200	\$126,900	\$159,100	\$129,860	8.47%
2024	\$12,400	\$105,500	\$56,300	\$127,000	\$183,300	\$152,180	8.15%
Total	\$39,100	\$290,800	\$113,600	\$493,600	\$607,200	\$480,640	8.13%

Based on the overall ratio, I am selecting a ULAE Ratio of 8.1%.

Estimate the pure IBNR as 5% of latest AY Ultimate: $(5\%)(183,300) = 9165$.

Estimated unpaid ULAE:

$(8.1\%) \{ (60\%)(9165) + (40\%)(607,200 - 290,800) \} = \mathbf{\$10,697}$.

Basic Reserving, Q. 17.15:

Calendar Year	Earned Premium (\$000)	Paid ULAE (\$000)
2021	3400	40
2022	5500	130
2023	5800	200
2024	6200	230