

# a/s/m


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*Actuarial Study Materials*

Learning Made Easier

## **Flashcards for SOA Exam STAM**

2nd Edition



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# Introductory Note for ASM Flashcards for Exam STAM

These flashcards will help you remember important formulas and concepts for Exam STAM. This introduction discusses the features of the cards.

On the back of each card, the left header states the broad topic for the card's content. The topics, and the lessons corresponding to these topics in various editions of the ASM STAM manual, are given in Table 1.

The left footer provides a cross-reference to the lesson number, page number, and table or formula number where applicable, of the 2<sup>nd</sup> edition of the ASM STAM manual. The pagination in the 1st edition of that manual are different, but the lesson, table, and formula numbers are the same.

On both the front and the back of each card, the right header indicates the importance of the card. The rating system is given in Table 2.

This exam has some non-mathematical reading. Flash cards for those readings ask you to reproduce lists. For example, you may be asked for a list of essential health benefits based on a certain law. Lists like these are very helpful for fellowship actuarial exams since they can be the basis of a

written answer question, but I doubt they will play much of a role on this mathematical multiple-choice exam. Accordingly I've given these cards a 1-star rating.

While flashcards are a useful study aid, they do not replace working out tons of exercises. Flashcards are limited to formulas or concepts that can be expressed briefly on a card, and only offer limited coverage of methods for solving problems, such as Bayesian calculations or bootstrap calculations. The number of flashcards for a topic depends on the number of formulas for that topic, but is not necessarily a measure of the importance of a topic.

If you find any errors in these cards, check the errata list at

[errata.aceyourexams.net](http://errata.aceyourexams.net)

If the error is not listed there, please send them to the publisher at

[mail@studymanuals.com](mailto:mail@studymanuals.com)

or send them to me directly at

[errata@aceyourexams.net](mailto:errata@aceyourexams.net)

In your error report, identify these cards as Exam STAM flashcards 2<sup>nd</sup> edition.

**Table 1:** Lessons in ASM manual corresponding to topic

Topic	Lessons
Probability Review	1-4
Insurance Coverages	5-6
Loss reserving and ratemaking	7-10
Severity Distributions	11-18
Risk Measures	16
Frequency Distributions	19-21
Aggregate Distributions	22-27
Parametric Estimators	29-31
Evaluation of Fit	32-36
Classical Credibility	38-40
Bayesian Credibility	41-46
Bühlmann Credibility	48-52
Empirical Bayes Methods	53-54

**Table 2:** Rating system

★★★★★	Essential—appears repeatedly on every exam
★★★★	Important—appears on every exam
★★★	Average importance—regularly appears on exams
★★	Not so important—appears occasionally on exams, or easy to derive as needed
★	Obscure—on syllabus, but unlikely to appear on exam. Sometimes this indicates a formula not covered by all the reading options. No released exam uses this formula or concept, and students have never reported a question from an unreleased exam requiring this formula or concept.



*Five components of auto insurance*

## Insurance Coverages



1. *Liability insurance (bodily injury and property damage)*
2. *Uninsured, underinsured, and unidentified motorist coverage*
3. *Medical benefits*
4. *Collision*
5. *Comprehensive*





*Two ways for insurance company to recover losses*

## Insurance Coverages



1. *Subrogation*

2. *Salvage*



*Five components of homeowners insurance*

## Insurance Coverages



1. *Damage to dwelling*
2. *Damage to garage/other structures on premises*
3. *Damage to contents*
4. *Additional living expenses*
5. *Liability*



## *Disappearing deductible*



*Deductible of  $d$  that decreases linearly to 0 at  $d + k$*



## *Coinsurance clause*



*If policy limit is less than 100k% of value at time of damage, insurance pays  $\frac{\text{limit}}{(k \times \text{value})}$  times loss.*





## *Loss Elimination Ratio*



$$\text{LER}_X(d) = \frac{\mathbf{E}[X \wedge d]}{\mathbf{E}[X]}$$



*Loss Elimination Ratio for exponential*

$$\text{LER}(d) = 1 - e^{-d/\theta}$$



*Loss Elimination Ratio for two-parameter  
Pareto*

$$\text{LER}(d) = 1 - \left( \frac{\theta}{d + \theta} \right)^{\alpha-1}$$
$$\alpha > 1$$



*Loss Elimination Ratio for single-parameter  
Pareto for  $d \geq \theta$*



$$\text{LER}(d) = 1 - \frac{(\theta/d)^{\alpha-1}}{\alpha}$$

$$\alpha > 1, d \geq \theta$$





## *Formula for ILF*



$$\text{ILF}(U) = \frac{\mathbf{E}[X \wedge U]}{\mathbf{E}[X \wedge B]}$$

*where B is basic limit*



*Three cautions for calculating ILFs*



- 1. Losses may not be independent of ILF.*
- 2. Policy limit selected may depend on likelihood of loss.*
- 3. Losses but not LAE are limited.*