

## Source

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<https://www.casact.org/university-programs/property-casualty-resource-library>

## Learning Objectives

The goal of this case study is to introduce the following key concepts related to warranties and tie those back to concepts to the actuarial exams:

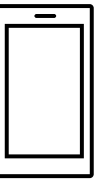
1. Expected Loss: Introduce the concept of and give example of calculation of expected loss based on probability.
2. Variance: Illustrated through an example calculation and visualized using a graph of the pdf.
3. Benefits of Insurance: Calculate profit for the insurer.

## Scenario

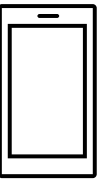
A cell phone company is considering offering a warranty to customers that are purchasing a new phone. The premium for the warranty (e.g. what the consumer/purchaser of the cell phone pays) is \$100. The policy spans a 1-year term and covers all repairs or replacement of the device if the phone stops working, is lost, or is stolen.

Your supervisor asks you to evaluate the proposed warranty. You will need to be able to answer the following:

- What is the expected loss to the cell phone company per warranty?
- What is the variability associated with loss to the cell phone company per warranty?
- What is the probability that the cell phone will lose more than the customer paid for their warranty?

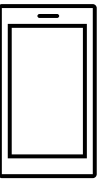


What information do you need to get started?



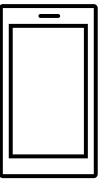
**Answer:** What is the expected loss to the cell phone company per warranty?

**Rephrasing this question:** What is the expected amount that the cell phone company would pay per warranty claim?



Answer: What is the variability associated with loss to the cell phone company per warranty?

**Rephrasing this question:** What is the standard deviation of the cell phone company loss?



**Answer:** What is the probability that the cell phone will lose more than the customer paid for their warranty?

**Rephrasing this question:** What is the probability that the cell phone company will pay more than \$100 to a claim?