

## Source

Casual Actuarial Society, University Engagement Advisory Working Group. Authors: Dave Terne and Mark Priven.

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

## Learning Objectives

The purpose of this case study is to introduce the following key concepts related to property/casualty pricing:

1. Probability: How an insurer uses probability to price a product.
2. Expenses: How an insurer will need to adjust prices for considerations unrelated to probability, such as expenses.

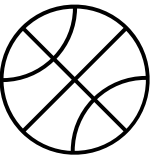
## Scenario

The Wabash Valley Sports Center wants more people to attend basketball games. They decide to hold a single Half-Time Half-Court shot every game to entice people. The shooter wins a 2026 Ford Mustang GT if they make the shot! They are planning for this event to occur for 50 games during the coming year. (This could get expensive!)

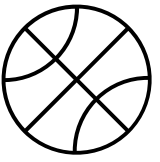
Dr. Heyman knows of an insurance company that would create a policy that pays the cost of the new car for every game where someone makes the shot. Dr. Heyman says she'll ask the insurance company how much they would charge, and if Wabash Valley Sports Center purchases the policy, Dr. Heyman gets a finder's fee of \$1,000 (paid by the insurance company).

Suppose that you must create a recommendation for the insurance policy price. Your supervisor needs the following to be able to approve your recommendation for the insurance policy price:

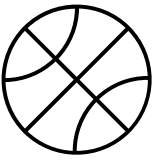
- What is the expected payout of the insurance policy for the year?
- (Assuming that the insurance company uses the expected payout for pricing): What should the final price of the policy be? What is the per game cost?
- If the insurance company charges the recommended final price for the policy, what is the probability that the insurance company will lose money?



What information do you need to get started?



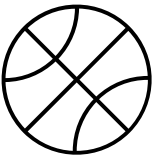
Answer: What is the expected payout of the insurance policy for the year?



Answer: What should the total final price of the policy be?

What is the per game cost?

(If we want, we may assume no extra profits built into the total final price.)



Answer: What is the probability that the insurance company will lose money?