

Problem Solving – Expected Value

It costs \$3.00 to throw one dart at this dartboard. If you hit a blank zone, you lose your bet and win nothing. If you hit a shaded zone, you get your \$3.00 bet back and also win \$10.00...

\$10					\$10
		\$10			
			\$10		
\$10					\$10

- [1] What is the probability that you lose \$3.00 by throwing one dart at this dartboard?
- [2] What is the probability that you win \$10.00 by throwing one dart at this dartboard?
- [3] Use your answers for problems [1] and [2] to set up an expected value table to determine the **expected value** for one throw at this dartboard.
- [4] Use your answer for problem [3] to determine how much money you could expect to win or lose if you were to throw **75 darts** at this dartboard.
- [5] Suppose that the two middle \$10 squares were changed to \$20. Create another expected value table, like that of problem [3] to determine the **expected value** of one throw at the revised dartboard.
- [6] Use your answer for problem [5] to determine how much money you could expect to win or lose if you were to throw **75 darts** at the revised dartboard.

The table at right shows weather conditions, their probabilities, and the average attendance at New Jersey Devils’ hockey games played under these weather conditions.

Weather	Prob.	Attendance
Sunny	36%	23,000
Cloudy	40%	16,000
Showers	17%	11,000
Snow	7%	3,000

- [7] The “value” in this problem really refers to the attendance. Set up an expected value table and use the information provided above to determine the overall **expected attendance** per game.
- [8] *Math Journal Question.* Suppose that you were in charge of ticket sales and promotions for the New Jersey Devils. What promotions could you do to increase overall attendance, and how would you use the table from problem [7] to come up with these ideas? Be sure to explain your reasoning.