Solutions

Algebra II Journal

Module 6: Conditional Probability

Prize Winner, Part 3

This journal belongs to:

Module 6: Conditional Probability

Algebra II Journal: Reflection 1

Use the interactive version of the Guess the Letter game provided on Prize Winner, Part 3, Page 4 on the website.

Run the simulation for at least 50 trials. Record the results in the table below and submit to your teacher.

Answer:

Answers will vary depending on the table students create.

Trial	Number of Doors Guessed Correctly	Trial	Number of Doors Guessed Correctly
1		38	
2		39	
3		40	
4		41	
5		42	
6		43	
7		44	
8		45	
9		46	
10		47	
11		48	
12		49	
13		50	
14			
15			
16			
17			
18			
19			
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21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			

Trial	Number of Doors Guessed Correctly	Trial	Number of Doors Guessed Correctly
35			
36			
37			

Algebra II Journal: Reflection 2

Out of your fifty (or more) trials, what is the probability that you win a small prize? Medium prize? Large Prize? Record these probabilities in the chart below.

Answer:

Answers will vary depending on the table students create.

Prize	Probability to Win *THEORETICAL*	Probability to Win *EXPERIMENTAL*
Small	$\frac{12}{27}$	
Medium	$\frac{6}{27}$	
Large	$\frac{1}{27}$	

Respond to the following reflection questions and submit to your teacher.

Compare the experimental probabilities with the theoretical probabilities. What conclusions can you draw?

Answer:

Answers will vary depending on the table students create.

If you played this game, what prize would you try for? Use the results of your simulation to support your answer.

Answer:

Answers will vary depending on the table students create.

Algebra II Journal: Reflection 3

Respond to the following reflection question and submit to your teacher.

The only item Khalid, Justyce, Andrew, Marissa and Allyson have left to discuss is what the prizes will be. They decide to award monetary prizes. They decide to award $1.00 for a small prize, $2.00 for a medium prize, and $5.00 for a large prize.

If these are the amounts for winning a prize, what should be the cost to play the game? Use what you know about the outcomes of this game to determine your answer. Be sure to use the results from your simulation as well as what you determined about the probabilities of winning to support your decision.

Answer:

Answers will vary based on the results of the student's simulation. Sample answer: To win a small prize, there is a theoretical probability of $\frac{12}{27}$. I got an experimental probability of $\frac{30}{50}$ for a small prize. The expected pay-out for this game would possibly be $\$1 \bullet \frac{12}{27} = \$0.44$ and $\$1 \bullet \frac{3}{5} = \$0.60$. To win a medium prize, there is a theoretical probability of $\frac{6}{27}$. I got an experimental probability of $\frac{15}{50}$ for a medium prize. The expected pay-out for this game would possibly be $\$2 \bullet \frac{6}{27} = \$0.44$ and $\$2 \bullet \frac{3}{10} = \$0.60$. To win a large prize, there is a theoretical probability of $\frac{1}{27}$. I got an experimental probability of $\frac{5}{50}$ for a large prize. The expected pay-out for this game would possibly be $\$5 \bullet \frac{1}{27} = \$0.19$ and $\$5 \bullet \frac{1}{5} = \$1$. Based on these results, I would charge $0.60 for the game. However, that makes for odd change (with dimes and such). So, I would round up to make the game $0.75.