Solutions

Algebra II Journal

Module 5: Probabilities of Compound Events

Fan Appreciation Night, Part 1

This journal belongs to:

Module 5: Probabilities of Compound Events

Algebra II Journal: Reflection 1

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

Determine the probability that someone in the group of friends wins the raffle in the 100 drawings. Make sure to include your reasoning for the solution you found.

Hints:

- Remember that there are 5000 entries in the drawing.
- The friends have 5 of the entries.
- To calculate the probability of an event **not** happening, subtract the probability of it happening from 1.

Answer:

To find the probability that someone in the group will win the prize, first you need to consider the probability that NONE of the friends win the prize. For the first drawing, the probability that no one in the group will win is $\frac{4995}{5000}$. For each successive drawing the numerator and denominator value will decrease by 1. So, to find the probability that none of the friends win, find the product for each drawing:

$\left(\frac{4995}{5000}\right)\left(\frac{4994}{4999}\right)\left(\frac{4993}{4998}\right)\left(\frac{4992}{4997}\right)\left(\frac{4991}{4996}\right)\cdot\ldots\cdot\left(\frac{4897}{4902}\right)\left(\frac{4896}{4901}\right) \approx 0.903$. So the probability that none of the friends will win is about 90.3%. This means that there is about a 10% chance that someone in the group of friends will win.

Algebra II Journal: Reflection 2

In this lesson, you reviewed experimental and theoretical probability, distinguished between independent and dependent events, and began to calculate the probability of compound events.

Respond to the following questions and submit to your teacher.

How can you determine if events are independent or dependent?

Answer:

Events are independent if the outcome of one event does not influence the outcome of the other event. Events are dependent when the outcome of one event impacts the outcome of the other event. If two events are independent, the probability of both events occurring can be found by finding the product of each individual event, so $P(A \text{ and } B) = P(A) \cdot P(B)$.

How do you calculate the probability of dependent events?

Answer:

To calculate the probability of dependent events, you must multiply the probability of event A with the probability of B after A occurs.