

Assignment

Write

1. A _____ is a collection or group of items and each item within it is called an _____.
2. The _____ is a set formed by combining all the members of the sets, such that all the members are only listed once.
3. Sets that do not have common elements are called _____.
4. Sets that do have common elements are called _____.
5. _____ and _____ are two types of visual models that display sample space.
6. Events for which the occurrence of one event has no impact on the occurrence of the other event are _____.
7. Events for which the occurrence of one event has an impact on the following events are _____.
8. The _____ states that if an action A can occur in m ways and for each of these m ways, an action B can occur in n ways, then Actions A and B can occur in $m \cdot n$ ways.

Remember

The Counting Principle states: "If an action A can occur in m ways and for each of these m ways, an action B can occur in n ways, then actions A and B can occur in $m \cdot n$ ways." The values for m and n are determined by whether the events are independent or dependent events.

Practice

1. Suppose you roll a number cube once.
 - a. Identify the sample space.
 - b. What is the probability of rolling a 5, $P(5)$?
 - c. What is the probability of rolling an even number, $P(\text{even})$?
 - d. What is the probability of rolling a number greater than 2, $P(\text{greater than } 2)$?
 - e. Construct the probability model for rolling a number cube.

Outcomes						
Probability						

- f. Is the probability model from part (e) a uniform or non-uniform probability model? Explain your reasoning.
- g. What is the probability of rolling a number that is not a multiple of 3, $P(\text{not a multiple of } 3)$?

2. For each scenario,

- Determine the actions.
 - Determine the outcomes of each action.
 - Determine whether the outcomes of each action belong to disjoint sets or intersecting sets. Explain your reasoning.
 - Sketch a tree diagram or write an organized list to represent the sample space.
 - Determine whether the events in each outcome of the sample space are independent or dependent.
 - Determine the size of the sample space using the Counting Principle. Show your calculation.
- a. While playing a board game, a player randomly chooses one card from each of the two decks, and then replaces the cards in the decks.
- b. Amanda randomly chooses a card from a deck of six cards, without replacing it, then chooses another card. The cards are numbered 1 through 6.

Deck A



Deck B



Stretch

1. Jacinta rolls two number cubes. Both number cubes are numbered from 1 to 6.
- a. What are the actions?
 - b. What are the outcomes of each action?
 - c. Determine the size of the sample space using the Counting Principle. Show your calculation.
 - d. Write an organized list that represents the sample space.
 - e. What is the probability of rolling two dice with a sum greater than 9, $P(\text{sum greater than } 9)$?
2. Jalen rolls a number cube that is numbered 1 through 6. He then flips a coin with heads on one side and tails on the other side.
- a. Are the events in each outcome of the sample space independent or dependent? Explain.
 - b. Write an organized list that represents the sample space.
 - c. What is the probability that the number on the cube is even and the result of the coin flip is tails, $P(\text{even number and tails})$?
 - d. If just the cube is rolled, what is the probability that the number rolled on the cube is an even number, $P(\text{even number})$?
 - e. If just the coin is flipped, what is the probability that it is tails, $P(\text{tails})$?
 - f. How do the answers to parts (c), (d), and (e) relate to each other?

Review

1. Determine the vertex, axis of symmetry, the value of p , the directrix, the focus, and the concavity for the parabola $(x - 1)^2 = 8(y + 3)$. Then graph the parabola.
2. Determine the equation of the parabola with focus $(0, -1)$ and directrix $y = 3$. Let (x, y) represent a point on the parabola.
3. Write an equation in standard form for each.
 - a. A circle with a center at $M(-2, 15)$ and a radius of $\sqrt{11}$
 - b. A circle with the same center as circle M , but whose area is 3 times that of circle M
4. Given $\sin \theta = \frac{\sqrt{2}}{2}$ in Quadrant II, use the Pythagorean identity to determine $\cos \theta$.
5. Use a trigonometric ratio to solve for the value of x . Round your answer to the nearest tenth.

