

TOPIC/OBJECTIVE:

Ch. Probability
Geometry

NAME:

CLASS/PERIOD:

3

DATE:

5/6/16

ESSENTIAL QUESTION:

What are some basic probability terms?

QUESTIONS:

NOTES:

Probability: The chance something will happen. In math, it's a fraction, decimal or % that represents a certain part of a whole.

Experiment: Any activity where there's uncertainty about what is going to happen. Eg: Flipping a coin, spinning a spinner, etc

Sample space: every possible outcome in an experiment.

Examples of sample spaces: S = sample space

Flipping a coin

Spin a Twister spinner

$S = \{H, T\}$

$S = \{Yellow, Green, Blue, Red\}$

Rules for probability:

1. Probability is always between 0 and 1 (including 0 and 1)
2. The prob of all outcomes in an experiment must add up to 1

An event is a specific set of outcomes in an experiment.

Examples of calculating the probability of an event: $P(E) = \frac{\# \text{ in the event}}{\text{total possible outcomes}}$

Experiment: rolling a six sided die

Event: the number is even

$P(\text{even}) = \frac{3 \leftarrow 3 \text{ even \#s (2, 4, 6)}}{6 \leftarrow \text{total numbers possible (1, 2, 3, 4, 5, 6)}}$

Independent and dependent events:

Events are independent if they do not effect each other's outcomes.

If they are not independent, events are dependent.

If events are independent then for Event A and Event B

$P(A \text{ and } B) = P(A) \cdot P(B)$

← only true for independent events

SUMMARY:

QUESTIONS:

NOTES:

$$P(E) = \frac{\text{\# of ways for E to happen}}{\text{total possible outcomes}}$$

Dice sum table:

		Die #1					
		1	2	3	4	5	6
Die #2	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

Probability using dice:

$$P(\text{Sum of 5}) = \frac{4}{36} \leftarrow \begin{matrix} 4 \text{ ways to get 5} \\ 36 \leftarrow 36 \text{ possible sums} \end{matrix}$$

$$P(\text{at least 8}) = P(\text{sum of } 8, 9, 10, 11, 12) = \frac{15}{36} = \frac{5}{12}$$

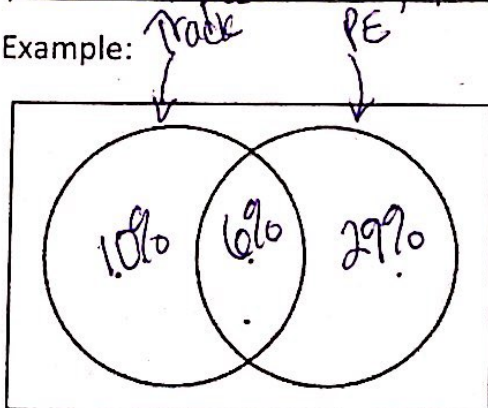
$$P(\text{mult. of 4}) = P(4, 8, 12) = \frac{3}{36} = \frac{1}{12}$$

$$P(3 | \text{odd}) = \frac{2}{18} \leftarrow \begin{matrix} 2 \leftarrow \# \text{ of 3s} \\ 18 \leftarrow \# \text{ of odd sums} \end{matrix}$$

A Venn Diagram is a diagram that shows a math or logic problem using pictures.

The circles represent events, the rectangle represents all possible outcomes (sample space).

Example:



16% of Benson students do track

35% of students take PE.

6% do both track and PE.

$$P(\text{Track or PE}) = 16\% + 35\% - 6\% = 45\%$$

$$= 10\% + 6\% + 29\% = 45\%$$

$$P(\text{neither PE nor Track}) = 100\% - 45\% = 55\%$$

A union is when an outcome is in one or another group. Symbol: \cup

An intersection is when an outcome belongs to two or more groups. (AND) symbol: \cap

Addition rule: $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

Example: A = event that we draw a club from a standard deck of cards

B = event that we draw a face card (Jack, Queen, King)

$$P(\text{Club or face card}) = \frac{13}{52} + \frac{12}{52} - \frac{3}{52} = \frac{22}{52} = \frac{11}{26}$$

SUMMARY: