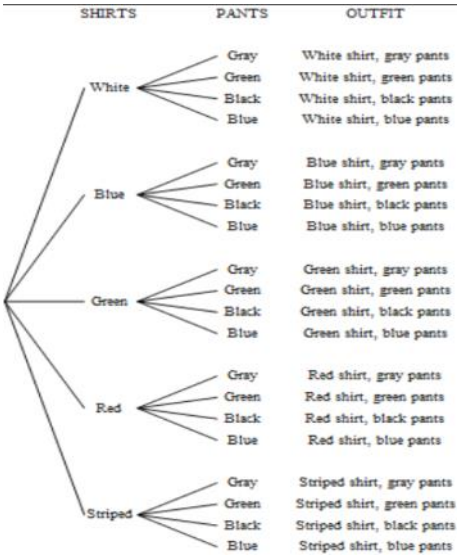
Probability

Monday, June 12, 2017 9:07 AM

Key Words

1. **Independent Events** - results for which the outcome of one event has no effect on the other event.
2. **Probability** - the likelihood or chance of an event occurring.
3. **Outcome** - the result in a probability experiment
4. **Favorable Outcome -** the successful result in a probability experiment.
5. **Sample Space** - all possible outcomes of a probability experiment.

Tree Diagram



Tree Diagram

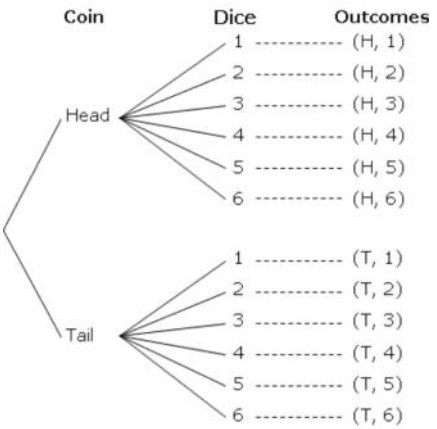
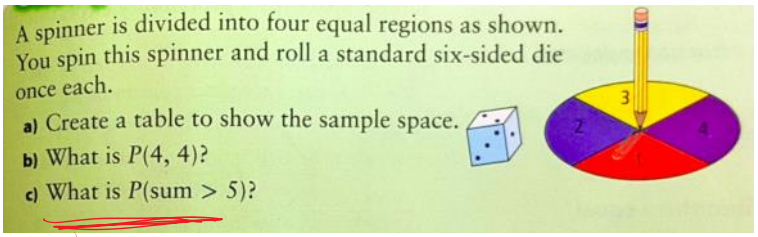


Table Diagram

		White Die					
		1	2	3	4	5	6
Red Die	1	(1,1)	(2,1)	(3,1)	(4,1)	(5,1)	(6,1)
	2	(1,2)	(2,2)	(3,2)	(4,2)	(5,2)	(6,2)
	3	(1,3)	(2,3)	(3,3)	(4,3)	(5,3)	(6,3)
	4	(1,4)	(2,4)	(3,4)	(4,4)	(5,4)	(6,4)
	5	(1,5)	(2,5)	(3,5)	(4,5)	(5,5)	(6,5)
	6	(1,6)	(2,6)	(3,6)	(4,6)	(5,6)	(6,6)



10/24 = 5/12

Spinner

Die \ Spinner	1	2	3	4
1	1,1	1,2	1,3	1,4
2	2,1	2,2	2,3	2,4
3	3,1	3,2	3,3	3,4
4	4,1	4,2	4,3	4,4
5	5,1	5,2	5,3	5,4
6	6,1	6,2	6,3	6,4

$\frac{1}{24}$

Ellen flips a coin and rolls a four-sided die numbered 1, 2, 3, and 4.

a) What is the sample space? Use a tree diagram to show how you got your answer.

b) What is $P(H, 4)$?

Coin — Dice

H: 1, 2, 3, 4

T: 1, 2, 3, 4

Outcomes: (H,1) (H,2) (H,3) (H,4) (T,1) (T,2) (T,3) (T,4)

$\frac{1}{8}$

Determining The Total Number of Outcomes

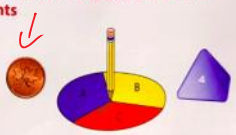
1. Create a table or tree diagram.
2. **Use multiplication**

Example 2: Determine the Total Number of Outcomes From Three or More Events

A coin is flipped, a spinner divided into three equal regions is spun, and a four-sided die numbered 1, 2, 3, and 4 is rolled.

a) How many possible outcomes are there?

b) Why could you not easily represent the sample space for this probability experiment with a table?



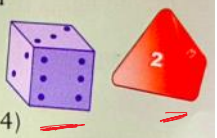
$2 \times 3 \times 4 = 24$

Determining Probability Using Fractions

A blue, standard six-sided die and a red, four-sided die numbered 1, 2, 3, and 4 are each rolled once. Determine the following probabilities, and then verify your calculations using a second method.

a) $P(\text{blue} = 4, \text{red} = 4)$ b) $P(\text{blue} < 4, \text{red} < 4)$

c) $P(\text{blue} = 4, \text{red} < 4)$



$\frac{1}{6} \times \frac{1}{4} = \frac{1}{24}$ $\frac{3}{6} \times \frac{3}{4} = \frac{9}{24}$

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