PROBABILITY

$\text{Prob}(\text{female}) = \frac{2}{5}$

$\text{Prob}(\text{not black shoes}) = \frac{1}{5}$

$$\text{Probability} = \frac{\#\text{ of ways to succeed}}{\text{total possible outcomes}}$$

$$\text{Odds} = \frac{\#\text{ of ways to succeed}}{\#\text{ of ways to fail}}$$

$\text{Odds}(\text{female}) = \frac{2}{3}$

$\text{Prob}(\text{rain}) = \frac{5}{7}$ $\frac{\text{suc}}{\text{total}}$

$\text{Odds}(\text{rain}) = \frac{5}{2}$ $\frac{\text{suc}}{\text{fail}}$

$\text{Prob}(\text{snow}) = \frac{2}{9}$ $\frac{\text{snow}}{\text{total}}$

$\text{Odds}(\text{no snow}) = \frac{\text{no snow}}{\text{snow}}$ $\frac{\text{suc}}{\text{fail}}$

$= \frac{7}{2}$

Windwalker Odds 2/5

Speedster Odds 10/1

Theoretical probability--the probability that should occur based on rules or formulas

Experimental probability--Estimating the probability of an event by performing the activity many times and using the results to estimate the probability

Sample Space--all possible outcomes from an event

Given: 2 coins (Nickel & Quarter) and 3 marbles (2 purple, 1 blue)

Select 1 coin and 2 marbles. List the sample space. P_1, P_2

$N P_1 B$ $Q P_1 B$

$N P_1 P_2$ $Q P_1 P_2$

$N P_2 B$ $Q P_2 B$

What is the probability of selecting a nickel and at least one purple marble?

$\frac{3}{6} = \frac{1}{2}$ OR 0.50

Geometric Probability--Estimating the probability using the area of a figure

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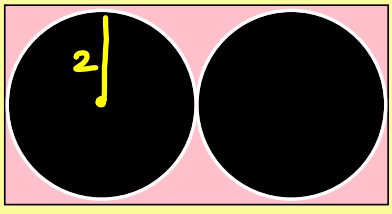

$A = \pi r^2 = \pi (2)^2 = 4\pi$

Prob (fly lands in pink)

$$\frac{\text{Area of pink}}{\text{Area of whole}} = \frac{32 - 8\pi}{32} \approx 0.215$$

$8 \cdot 4$

The Easter bunny brings you an Easter basket filled with 6 peanut butter eggs, 4 caramel eggs, and 2 solid chocolate eggs. Your mother will only allow you to have 3 eggs at a time.

What is the probability that you select 3 peanut butter eggs?

$$\text{Prob}(3 \text{ p.b.}) = \frac{{}_6C_3}{{}_{12}C_3} \quad \frac{\text{succeed}}{\text{total}} \approx 0.0909 = \frac{1}{11}$$

What are the odds that you select 3 peanut butter eggs? Always find prob. first!

$$\text{Odds} = \frac{\text{succeed}}{\text{fail}} = \frac{{}_6C_3}{\quad}$$

$$\text{Prob} = \frac{1}{11} \quad \text{Odds} = \frac{1}{10}$$

6 peanut butter
4 caramel
2 chocolate

What is the probability that you select 2 caramel eggs and 1 chocolate egg?

$$\text{Prob}(2 \text{ caramel}, 1 \text{ choc}) = \frac{{}_4C_2 \cdot {}_2C_1}{{}_{12}C_3} = \frac{3}{55}$$

odds $\frac{3}{52}$

If 5 eggs are selected, what is the probability of selecting 3 caramel eggs?

$$\text{Prob}(3 \text{ caramels} + 2 \text{ others}) = \frac{{}_4C_3 \cdot {}_8C_2}{{}_{12}C_5} = \frac{14}{99} \text{ OR } 0.141$$