

AP Stats
11/26/07
6-1

Monty Hall's Let's Make a Deal



Simulation

http://people.hofstra.edu/steven_r_costenoble/MontyHall/MontyHallSim.html

Big Simulation (ongoing)

<http://math.ucsd.edu/~crypto/Monty/monty.html>

Permutations

ORDER MATTERS

FUNDAMENTAL THEOREM OF COUNTING

PHONE #'s

$$\cancel{10}^8 \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10}$$

LOCKERS

Combinations

ORDER DOES
MATTER

NOT

→ r objects taken from a set of n

$$\binom{n}{r} = \frac{n!}{r!(n-r)!}$$

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$

$$\underline{5} \cdot \underline{4} \cdot \underline{3} \cdot \underline{2} \cdot \underline{1}$$

Pick 6 #s from 1-50

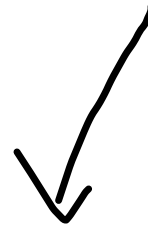
$$\binom{50}{6} = \frac{50!}{6!(50-6)!}$$

$$\text{Probability} = \frac{\text{\# of ways to get "success"}}{\text{total \# of ways possible}}$$

$$\frac{1}{15,890,700}$$

$$\text{Odds} = \frac{\text{success}}{\text{failure}}$$

$$P(\text{success}) = \frac{3}{5}$$



$$\frac{\text{ODDS}}{2/3}$$

$$3:2$$



Las Vegas and Long-run probability

On average, people will spend \$650 on a single slot machine in a day.
A typical machine gives the house a 2.3% advantage.
There are 1200 machines in a casino.
How much profit might these machines generate in a year?