Probability and Odds Day 2

When all outcomes are equally likely, the odds that an even will occur are:

$$\text{odds} = \frac{\text{\# favorable outcomes}}{\text{\# unfavorable outcomes}}$$

Example: You roll 2 dice. What are the odds that you get a 7 or higher?

Favorable outcomes: 7, 8, 9, 10, 11, 12

Unfavorable outcomes: 6, 5, 4, 3, 2

Odds: $\frac{6}{5}$ 6 to 5

How are probability and odds different?

Denominator of odds: # of failures

Denominator of probability: Total # of outcomes (Trials, successes & failures)

If you know the probability that an event will occur, then you can find the odds.

$$\text{odds} = \frac{\text{probability event will occur}}{\text{probability event will not occur}}$$
$$= \frac{\text{probability event will occur}}{1 - \text{probability event will occur}}$$

$N + Y = 1$
$-Y \quad -Y$
$N = 1 - Y$

Example: The probability a randomly chosen student has a cell phone is 0.83. What are the odds that a student has a cell phone?

$$\frac{0.83}{1-0.83} = \frac{.83}{.17} = \frac{83}{17}$$

83 to 17

300 to 1

12,999 to 1

Often we write odds as x to y, where x is the successes, y is the failure and x + y is the total number of outcomes.

You have a 25% chance of winning, what are your odds?

The probability of selecting the correct box is 1/36 what are your odds?