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: 2, 3, 4, 5, 6

Odds: \( \frac{6}{5} \) or 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 ___________ that an event will occur, then you can find the _______.

probability

odds
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?

\[
\text{odds} = \frac{\text{probability event will occur}}{\text{probability event will not occur}} = \frac{0.83}{1 - 0.83} = \frac{0.83}{0.17} = \frac{83}{17}
\]

The odds are $83$ to $17$, or approximately $300$ to $1$ and $12,999$ 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?