

# Probability and Odds

probability of an event =  $\frac{\text{the \# of ways event can occur}}{\text{total \# of outcomes}}$

ex A bag of marbles contains 5 red, 4 blue, 3 green, and 2 yellow.

$$P(\text{blue}) = \frac{4 \text{ blue marbles}}{14 \text{ total marbles}} = \frac{2}{7}$$

$$\text{Probability} = \frac{\text{\# winners}}{\text{total \#}}$$

odds of  
an event =  $\frac{\# \text{ winners}}{\# \text{ losers}}$

ex Weather forecast predicts 30% chance  
of rain tomorrow.

$$30\% \rightarrow \frac{30}{100} \quad P(\text{rain}) = \frac{3}{10} \left\{ \begin{array}{l} \leftarrow \# \text{ winners} \\ \leftarrow \text{total \#} \end{array} \right.$$

$$\text{odds} \rightarrow O(\text{rain}) = 3:7 \left\{ \begin{array}{l} \text{winners} \\ \text{losers} \end{array} \right.$$