

Lesson Five: Odds and Probability

Now that you are familiar with both **odds** and **probability**, you need to learn how to convert one to the other, and back again.

Recall that probability is a fraction that compares **favourable outcomes** to **TOTAL OUTCOMES** while odds compares **favourable outcomes** to **undesired outcomes**. Both are shown below:

$$\text{Probability} = \frac{\text{Favorable Outcomes}}{\text{Total Outcomes}}$$

$$\text{Odds} = \text{Favourable Outcomes} : \text{Undesired Outcomes}$$

Example 1

A bag contains 3 gold coins and 8 brass coins. You choose a coin at random out of the bag.

- State the probability of choosing a gold coin.
- State the odds for choosing a gold coin.
- State the odds against choosing a brass coin.

a) $P(\text{gold}) = \frac{\text{gold coin}}{\text{TOTAL \# of coins}} \Rightarrow \frac{3}{11}$

$P(\text{gold}) = \frac{3}{11}$

b) ODDS: # of gold coin : NOT gold coin
3 : 8

c) ODDS: NOT Brass : Brass
3 : 8

Example 2

The probability that the Winnipeg Jets win a game against the Washington Capitals is $\frac{4}{11}$. State the **odds** in favour of the Jets winning a game against the Capitals.

ODDS: Win : Win : NOT Win
4 : 7

Win = 4
NOT Win = 7
TOTAL = 11