MDM4U **Odds** Date: _____

Odds – The probability that an event will occur compared with the probability of its not occurring. This comparison is usually expressed as a ratio in favour or against. The general interpretation of **odds** is the *degree of confidence* that someone has that an event will occur.

Example: If two coins are tossed, the possible outcomes are HH, HT, TH, TT.

P(two heads appearing) = $\frac{1}{4}$

P(two heads not appearing) = $\frac{3}{4}$

The odds are expressed as 1 to 3 in favour or 3 to 1 against.

odds in favour of A = $\frac{P(A)}{P(A')} = \frac{n(A)}{n(A')}$

odds against A = $\frac{P(A')}{P(A)} = \frac{n(A')}{n(A)}$

Probability and Odds

The terms probability and odds are often used interchangeably. However, they mean two different things.

Example: There are 4 white balls and 7 black balls in a bag. You need to select one ball.

- The probability that you will select a white ball is _____
- The odds that you will select a white ball are _____

$P(A) = \frac{n(A)}{n(S)}$ odds in favour of A = $\frac{n(A)}{n(A')}$

Therefore odds can be greater than 1, but probabilities must always be between 0 and 1.

In general, it can be shown that if the odds in favour of $A = \frac{h}{k}$, then $P(A) = \frac{h}{h+k}$