GRADE 12 ESSENTIAL
UNIT I – PROBABILITY
ODDS

Name: _____
Date: _____

There is more than one way to express the chance of something happening or not happening!

Probability = $\frac{\#of\ favourable\ \ outcomes}{\#\ of\ \ total\ possible\ outcomes}$

Odds is basically the same but instead of comparing **what you want** with what **you could get**, you are comparing **what you want** to what you **don't want!** Just that easy!

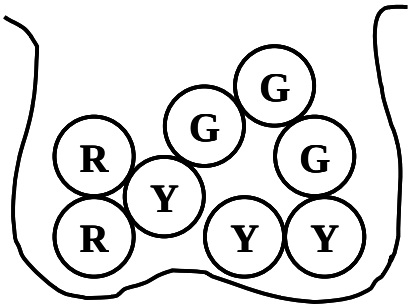
There are **two forms** of odds:

Odds in Favour of something happening;
Odds in favour =
# of favourable outcomes : # of *un*favourable outcomes

Odds Against something happening;
Odds against =
*# of **un**favourable outcomes* **:** *# of favourable outcomes*

Notice we tend to not write odds as a fraction but as a ratio with a colon symbol, **:**, especially to avoid confusion with the probability ratio. Or some time just the word '**to**'.

Example: If the favourable event is drawing a Green marble from the bag then:



Prob (Green) = $\frac{3}{8}$ or 0.375 or 37.5%
Odds *in Favour* of Green = **3 : 5**

Odds *Against* Green = **5 : 3**

1. Kyla has four different dollies. Her favourite is Misha. There are 24 different arrangements of ways she can **line** up all the different dolls on a shelf. Six of those arrangements have Misha on the left

   a. what is the probability that Misha is on the left?
   b. what are the Odds *in Favour* of Misha being on the left?

we should always simplify Odds just like we do for fractions; eg: 8:2 is 4:1

2. The weather network says there is a 30% probability of rain.

   a. what are the Odds *in Favour* of rain?

   b. what are the Odds *Against* rain?

3. On a quiz out of **10** marks, the scores of several students were: **{ 3, 4, 6, 7, 7, 8, and 10 }**. A school inspector comes by and wants to randomly select one student's quiz. The teacher hopes the inspector picks a good one! Determine the odds in favour of a randomly selected quiz having a percentage mark greater than 50%.

4. The Odds Against an event occurring are 1 to 5. Express the **probability** for the event occurring.

5. Describe a situation that would have favourable odds (ie: odds in favour) of **5 : 2**

6. Express the probability (in any particular year) of there being an October snowstorm somewhere in Manitoba given that the **Odds For** this occurrence are **3 to 1**. Express the answer in **%** and in fraction.

7. Explain the difference between odds and probability. Explain means in your own words and using proper sentence(s). An example is always useful to help your explanation.

8. The odds on selecting a red smartie from a box of smarties is 3:14. There are 42 smarties in a box, determine how many red smarties you can *expect* in a box.

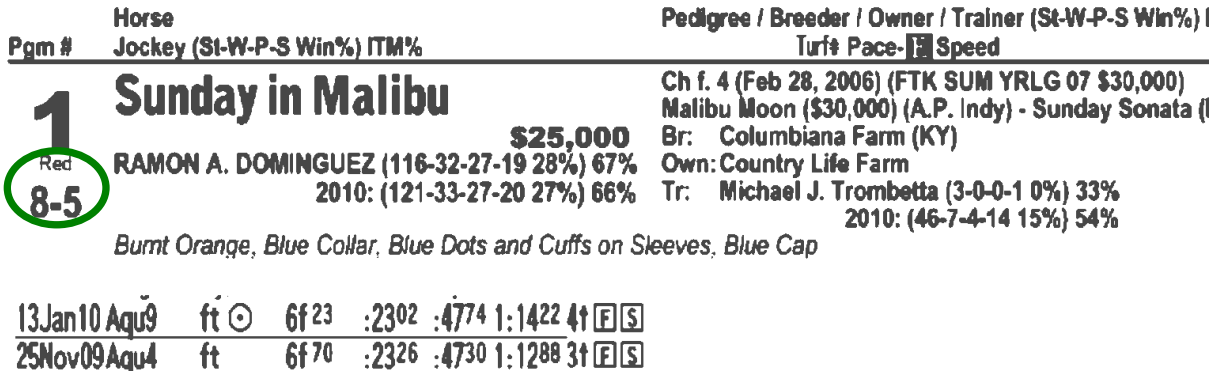
9. The City of Selkirk is planning a Fun Day.

a. The probability of it raining on Fun Day is **3 out of 20**. State the odds that it will **not** rain on Fun Day.
b. The Odds **For** winning a prize at Fun Day are **5 : 3**. State the **probability** of winning a prize.
c. With Odds For of **5 : 3**, your child plays 16 games; state how many prizes your child *should likely* win.

10. The **Odds Against** a certain horse to **Win** a race (as opposed to **Place** or **Show**) is listed in the race program as **8 : 5**. Determine the probability the horse will win.

*Example Entry in a Race Program: They always give the **Odds Against a Win;** it works out easier that way to calculate the 'payoff'. If the probability of losing is high (the odds **against** a win are high), then the payoff is better! In this case here, if you bet $5, you get $8 back if Malibu wins. Me, I bet $2 on losers, like 20:1; then I have a 5% chance of winning $40. Which of course is not really a win if I have to bet $2 twenty times to maybe win $40.*

We will learn about gambling in a lesson on EXPECTED VALUE.



Pgm #	Horse Jockey (St-W-P-S Win%) ITM%	Pedigree / Breeder / Owner / Trainer (St-W-P-S Win%) I Turf Pace- Speed
1 Red 8-5	**Sunday in Malibu** $25,000 RAMON A. DOMINGUEZ (116-32-27-19 28%) 67% 2010: (121-33-27-20 27%) 66%	Ch f. 4 (Feb 28, 2006) (FTK SUM YRLG 07 $30,000) Malibu Moon ($30,000) (A.P. Indy) - Sunday Sonata (I Br: Columbiana Farm (KY) Own: Country Life Farm Tr: Michael J. Trombetta (3-0-0-1 0%) 33% 2010: (46-7-4-14 15%) 54%

Burnt Orange, Blue Collar, Blue Dots and Cuffs on Sleeves, Blue Cap

13Jan10 Aqu9	ft ⊙	6f 23	:23 02	:47 74	1:14 22	4t	F S
25Nov09 Aqu4	ft	6f 70	:23 26	:47 30	1:12 88	3t	F S

11. Complete the blanks in the table. **Always** reduce fractions and ratios to simplest form for full marks. (use the **a b/c** button on your calculator if you have too)

Probability % Of Event Of Event	**Probability of Event Fraction**	**Odds in Favour Of Event**	**Odds Against Event**
20%	$\frac{20}{100} = \frac{1}{5}$	1 : 4	4 : 1
90%			
5%			
35%			
		4 : 1	
		5 to 12	
		1 : 3	
			8:1
			7:5
			4:5
	$\frac{3}{4}$		
	$\frac{5}{8}$		
Make up your own couple!			
Optional		**m : n**	