Name: _____ MDM 4U1 Date: _____

1.6 Part 2: The Odds

We often hear the words 'the odds' when dealing with probability questions. What does this actually mean? Let's start with a familiar example:

What are the **odds** of winning Lotto 6/49?

A. Odds

Though it's common to use 'odds' and 'probability' interchangeably, they actually mean different things.

Probability: expressed as a fraction or percent

$$probability = \frac{number\ of\ favourable\ outcomes}{total\ outcomes}$$

Odds: expressed as a ratio

number of favorable outcomes : number of unfavorable outcomes

or $n(A) : n(A')$

Example 1

There are four white balls and seven black balls in a bag. You reach into the bag to select 1 ball.

a) What is the **probability** that you will select a white ball?

b) What are the **odds** of selecting a white ball?

c) What are the odds **against** Selecting a white ball?

Example 2

The chance of a snowstorm in March is estimated at 0.4. What are the odds **against** having a snowstorm?

Example 3

A professor states the odds of passing their course are 8 to 1. What is the probability of passing the course?

Example 4

The odds of hitting a home run are 2:7. What is the probability of hitting a home run?

Odds Homework: Pg 263 #11-16

1.7: The Triangle

Though you may have heard about Pascal's Triangle in the West, it was actually discovered and studied in many parts of the world. For example, in Iran it is referred to the Khayyam Triangle and in China is referred to as the Yang Hui Triangle. The Triangle has some surprising applications when it comes to counting and probability:

A. The Triangle

Create a Pascal's Triangle below. See how far you can get without using a calculator!

B. Patterns in the triangle

1. Combinations
2. Sum of the rows
3. Symmetry
4. Any others?

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Pascal's Triangle Practice

Use the Table to Determine:

1. $\binom{6}{4}$
2. $\binom{4}{1}$
3. $\binom{4}{4}$
4. $\binom{4}{5}$
5. $\binom{4}{0}$
6. $\binom{0}{0}$
7. $\binom{8}{3}$
8. $\binom{8}{5}$
9. $\binom{8}{4}$
10. $\binom{1029}{1}$
11. $\binom{3}{0}+\binom{3}{1}+\binom{3}{2}+\binom{3}{3}$

Pascal's Triangle Practice

***McGraw-Hill Ryerson Mathematics of Data Management*, pp. 247–253**

1. Fill in the missing numbers of this part of Pascal's triangle.

36 84 __ 12
6
__ 21 __
0
__ __

2. Find the missing numbers of this part of Pascal's triangle.

__ 25 300 __
26 __ 260
0
__ __

3. Determine the sum of the terms in the 10th row of Pascal's triangle.

4. Determine the sum of the 15th row of Pascal's triangle.

Answers

1. 126, 120, 252, 330, 462

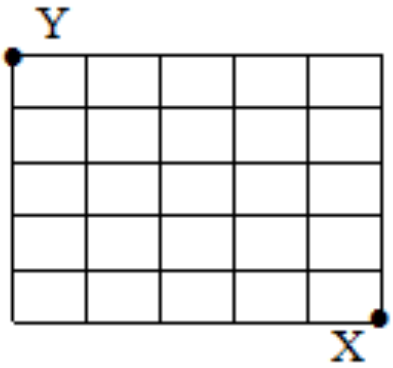
2. 1, 2300, 325, 351, 2925

3. 1024

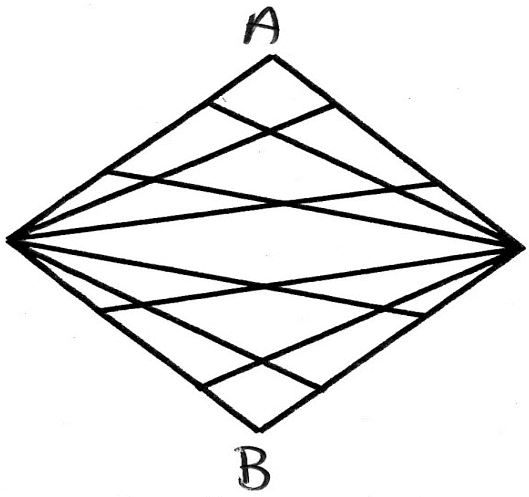
4. 32 768

Use Pascal's Triangle to determine the number of paths

a) Count the number of paths from Y to X travelling only down or to the right at each intersection.

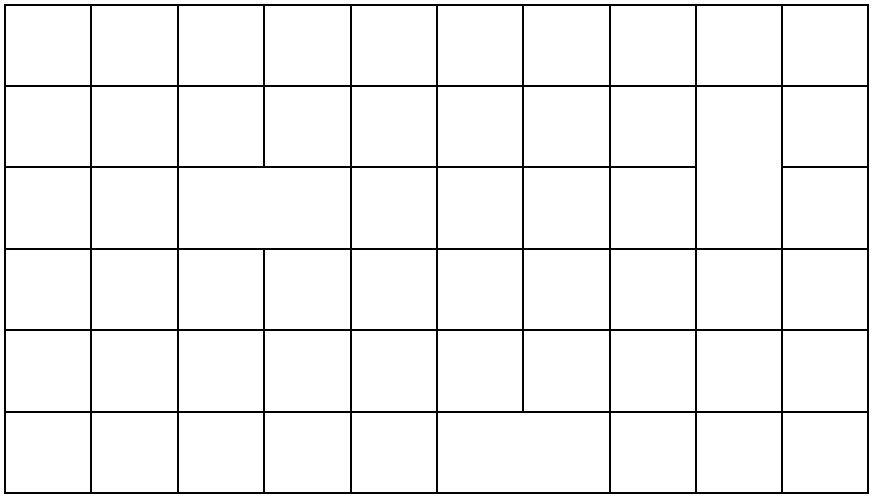


b) How many paths lead from A to B, going only down each intersection?



c) How many paths lead from home to school, walking only down or to the right at each intersection?

Home



School

1.7 Playing Games

B. Fairness

Unit Task

Before we can start calculating any sort of complicated probabilities, we need to all be on the same page with the language we are using…

Unit assignment – make a game that LOOKS like it's fair but isn't.
Show the probabilities
Work in partners
Try it out! Record who wins.