# Quiz 2

MATH 100:11 Mathematical Concepts
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Name: SOLUTIONS

You may use calculators, but each question can be done without them. The quiz is out of 10. This quiz is double-sided!

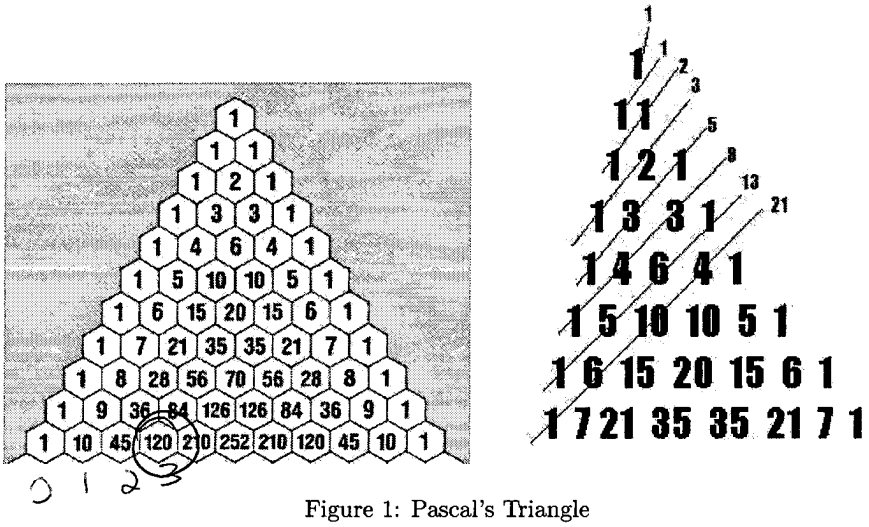


Figure 1: Pascal's Triangle

1. Use Pascal's triangle for this question. [3]

   (a) Suppose you have a bag of 10 balls, each of a different colour. How many different colour combinations of 3 different coloured balls can you pick, assuming order doesn't matter? 120

   (go to 10th row - numbers correspond to 0, 1, 2, 3, ... balls)

   (b) How many with 7 different balls? Is this the same as for 3, and if so, why?

   120 - same as choosing 3 balls to leave out

2. Consider the second image of Pascal's triangle given above. It shows some diagonal lines. The numbers at the end of each line represent the sum of the numbers that the line goes through. What is the pattern of these numbers (the sums), starting at the top and going down? Explain. [2]

   Sequence 1, 1, 2, 3, 5, 8, 13, 21, ...

   Fibonacci - each is sum of the two before

3. Give an example of a collection of objects that is not well-defined (and explain why not). [2]

set of good students at StFX

how do you define good?

4. Let $A = \{2, -2, 4, -4, \cdots, 12, -12\}$. Find $n(A)$. [1]

$= \{2, -2, 4, -4, 6, -6, 8, -8, 10, -10, 12, -12\}$

$n(A) = 12$

5. Let $B = \{1, 2, 3, \{1, 2\}, \{3\}, \{2, 4\}\}$.

For each of the following, determine if the statement is true (T) or false (F). You don't need to explain. [2]

(a) $2 \in B$. T

(b) $\{2, 4\} \subseteq B$. F don't have $4 \in B$

(c) $\{1\} \in B$. F

(d) $\{1, 2\} \subseteq B$. T