

**UWO Math 2124 Fall 2019**  
**Introduction to Mathematical Problems**  
**Instructor: Rasul Shafikov**  
**Handout: Nov 19**

**Example 5.1** Which are more among the natural numbers between 1 and 1,000,000: numbers that can be represented as a sum of a perfect square and a (positive) perfect cube, or numbers that cannot?

**Example 5.2** Eight boys and nine girls sit in a row of 17 seats.

- (a) How many different seating arrangements are there?
- (b) How many different seating arrangements are there if all the boys sit next to each other and all the girls sit next to each other?
- (c) How many different seating arrangements are there if no child sits next to a child of the same sex?

**Example 5.3** Suppose we have 3 different toys and we want to give them away to two girls and one boy (one toy per child). The children will be selected from a group of four boys and six girls. In how many ways can this be done?

**Example 5.4** How many different ordered triples  $(a,b,c)$  of nonnegative integers are there such that  $a+b+c=50$ ?