

Problem Set 1

Combinatorics

Suppose you have exactly 6 different-colored beads (Red, Orange, Yellow, Green, Blue, Purple).

1. You make a “line” with 3 of the beads. How many different “lines” could you make?

2. You grab a “handful” of 3 of the beads. How many different “handfuls” could you grab?

Suppose have a very large supply of beads of each of the 6 colors (Red, Orange, Yellow, Green, Blue, Purple).

3. You make a “line” with 3 of the beads. How many different “lines” could you make?

4. You grab a “handful” of 3 of the beads. How many different “handfuls” could you grab?

Problem Set 2

Graph theory

Suppose you had 6 vertices on a graph, each with degree 3 (i.e., $\{3,3,3,3,3,3\}$).

1. Can you draw such a graph? (i.e., does such a graph exist?)

2. How many *different* graphs can you draw?

Suppose you had 6 vertices on a graph, each with degree 2 (i.e., $\{2,2,2,2,2,2\}$).

3. Can you draw such a graph? (i.e., does such a graph exist?)

4. How many *different* graphs can you draw?