

Discrete Math
Quiz 11

Name: _____

You have 10 minutes to complete this quiz. You may not use any unauthorized sources and you may not communicate with others about the exam. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. How many different strings can be formed by rearranging the letters of MISSISSIPPI?

$$\binom{11}{1, 2, 4, 4} = 34650$$

2. How many ways are there to make 3 fruit baskets from 8 pineapples, 10 pomegranates, 6 coconuts and 20 figs if each basket must contain each kind of fruit?

Begin by distributing one fruit of each type to each of the 3 baskets. This leaves 5 pineapples, 7 pomegranates, 3 coconuts and 17 figs to distribute arbitrarily. There are

- $\binom{5+3-1}{5} = \binom{7}{5}$ ways to distribute the remaining pineapples,
- $\binom{7+3-1}{7} = \binom{9}{7}$ ways to distribute the remaining pomegranates,
- $\binom{3+3-1}{3} = \binom{5}{3}$ ways to distribute the remaining coconuts, and
- $\binom{17+3-1}{17} = \binom{19}{17}$ ways to distribute the remaining figs.

Thus, the number of ways to make 3 baskets is $\binom{7}{5} \binom{9}{7} \binom{5}{3} \binom{19}{17} = \frac{9!19!}{(2!)^4 3! 17!}$.