

Discrete Math
Quiz 10

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 “words” (= strings) may be formed with a 26-letter alphabet if
- (a) the words consist of 5 letters, and the letters must be distinct?

$$(26)_5 = \frac{26!}{21!} = 26 \cdot 25 \cdot 24 \cdot 23 \cdot 22$$

- (b) the words consist of 5 letters, and the letters need not be distinct?

$$26^5 = 26 \cdot 26 \cdot 26 \cdot 26 \cdot 26$$

2. Give an example of a counting problem whose solution is $m! + n!$.

Suppose you have two envelopes, each filled with slips of paper. The first envelope has m slips of paper on which are written distinct numerical digits, and the second envelope has n slips of paper on which are written distinct letters. You must choose one envelope (only) and order the slips of paper inside. How many outcomes are there? (Answer: $m! + n!$.)