

# Math 112 - Quiz 12

November 30, 2017

Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) A class is made up of **8 freshmen and 9 sophomores**. A seven-person committee is to be formed.

- (a) Selecting from only the freshmen, how many different groups of 3 freshmen are there?

$${}^8C_3 = \frac{8!}{5!3!} = \frac{8 \times 7 \times 6}{3 \times 2 \times 1} = \boxed{56}$$

- (b) Selecting from only the sophomores, how many different groups of 4 sophomores are there?

$${}^9C_4 = \frac{9!}{5!4!} = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} = \boxed{126}$$

- (c) Selecting from the entire class, how many different 7-person groups are made up of exactly 3 freshmen and 4 sophomores?

$${}^8C_3 \times {}^9C_4 = 56 \times 126 = \boxed{7056}$$

2. (2 points) Determine the value of each of the following.

(a)  ${}^{12}C_9 = \frac{12!}{3!9!} = \frac{12 \times 11 \times 10}{3 \times 2 \times 1} = \boxed{220}$

(b)  $\frac{100!}{96!4!} = \frac{100 \times 99 \times 98 \times 97}{4 \times 3 \times 2 \times 1} = \boxed{3,921,225}$

3. (2 point) A letter is selected at random from the word *HOUSE*.

- (a) What is the sample space for this experiment?

$$\{H, O, U, S, E\}$$

- (b) Let  $A$  be the event of selecting a letter other than  $S$  or  $E$ . Write  $A$  in roster notation.

$$A = \{H, O, U\}$$