

Math 099 - Assignment 10

November 12, 2018

Name key
Score _____

Show all work to receive full credit. Supply explanations when necessary. This assignment is worth 5 points.

1. $n! = 1 \times 2 \times 3 \times \cdots \times (n-1) \times n$. Compute each of the following. Show work or explain.

(a) $7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$

(b) $12!$ if $11! = 39916800$

$$12 \times 39916800 = 479,001,600$$

(c) $\frac{275!}{273!} = \frac{275 \times 274 \times 273!}{273!} = 275 \times 274 = 75,350$

2. ${}_n P_k = \frac{n!}{(n-k)!}$. Compute each of the following. Show work or explain.

(a) ${}_5 P_3 = \frac{5!}{2!} = 5 \times 4 \times 3 = 60$

(b) ${}_{1000} P_{999} = \frac{1000!}{1!} = 1000!$

3. ${}_n C_k = \frac{n!}{k!(n-k)!}$. Compute each of the following. Show work or explain.

(a) ${}_6 C_3 = \frac{6!}{3!3!} = \frac{6 \times 5 \times 4}{3!} = 5 \times 4 = 20$

(b) ${}_{500} C_{488} = \frac{500!}{488!12!} = \frac{500 \times 499 \times 498 \times \cdots \times 489}{12 \times 11 \times 10 \times \cdots \times 1} \approx 4.46 \times 10^{23}$