Name _____ Date _____

LESSON 6.1

Graphing Calculator Activity: Permutations and Combinations

For use before the lesson "Use Combinations and the Binomial Theorem"

QUESTION **How can you use a graphing calculator to find the number of permutations and combinations?**

The number of permutations of r objects taken from a group of n distinct objects is denoted by ${}_nP_r$ and is given by the formula

$${}_nP_r = \frac{n!}{(n-r)!}.$$

The number of combinations of r objects taken from a group of n distinct objects is denoted by ${}_nC_r$ and is given by the formula

$${}_nC_r = \frac{n!}{(n-r)! \cdot r!}.$$

EXAMPLE **Find permutations and combinations**

Use a graphing calculator to find the number of permutations and combinations.

a. ${}_{10}P_3$ **b.** ${}_8C_2$

Solution

a. Use the following keystrokes.

1 0 **MATH** ◀ 2 3 **ENTER**

The number of permutations of 10 objects taken 3 at a time is 720.

b. Use the following keystrokes.

8 **MATH** ◀ 3 2 **ENTER**

The number of combinations of 8 objects taken 2 at a time is 28.

PRACTICE **Use a graphing calculator to find the number of permutations and combinations.**

1. ${}_6P_6$ **2.** ${}_{13}P_0$ **3.** ${}_{22}P_3$

4. The number of permutations of 15 objects taken 5 at a time

5. The number of permutations of 9 objects taken 3 at a time

6. The number of permutations of 12 objects taken 6 at a time

7. ${}_{20}C_2$ **8.** ${}_{11}C_6$ **9.** ${}_5C_3$

10. The number of combinations of 15 objects taken 3 at a time

11. The number of combinations of 7 objects taken 4 at a time

12. The number of combinations of 13 objects taken 13 at a time

Name _____ Date _____

LESSON 6.1

Graphing Calculator Activity: Permutations and Combinations *continued*

For use before the lesson "Use Combinations and the Binomial Theorem"

TI-83 Plus

a. 1 0 MATH ◀ 2 3 ENTER

b. 8 MATH ◀ 3 2 ENTER

Casio CFX-9850GC Plus

Begin by displaying the menu containing the *permutation* and *combination* functions.

From the main menu, choose RUN.

OPTN F6 F3

a. 1 0 F2 3 EXE

b. 8 F3 2 EXE