

Exploration 9-5a: Reading about Combinations

Date: _____

Objective: Learn about combinations by reading the text.

1. Skim Section 9-5. Summarize what you think is the major point of the section.
2. Read the section again, far enough to explain why AEI and IAE are the same combination of three vowels but different permutations.
3. State the definition of **combination**.
4. There are 60 different three-letter permutations of the five vowels AEIOU. How many different combinations can be made?
5. Write one symbol for the number of combinations of five elements taken three at a time.
6. Read Example 2 of Section 9-5. Use what you learn to write this expression as a ratio of two factorials.
$$10 \cdot 9 \cdot 8 \cdot 7$$
7. Write ${}_{10}C_4$ as a fraction involving factorials.
8. Evaluate the fraction in Problem 7.
9. Evaluate ${}_{10}C_4$ using the built-in feature of your grapher. Show that the answer is the same as in Problem 8.
10. Expand: $(a + b)^2$.
11. Expand $(a + b)^3$ by writing it as $(a + b)(a + b)^2$ and using the result of Problem 10.
12. Expand $(a + b)^4$ by writing it as $(a + b)(a + b)^3$ and using the results of Problem 11.
13. Show that the coefficients 1, 4, 6, 4, and 1 in Problem 12 are equal to ${}_4C_0$, ${}_4C_1$, ${}_4C_2$, ${}_4C_3$, and ${}_4C_4$, respectively.
14. What did you learn as a result of doing this Exploration that you did not know before?