Math 12 Pre-Calculus LG 18

PERMUTATIONS AND COMBINATIONS

INTRODUCTION:

Combinatorics is a branch of mathematics that involves the art of counting. Check out pages 514 - 515.

LEARNING GUIDE EXPECTATIONS:

On the completion of this learning guide you will be able to:

1) Solve problems using the Fundamental Counting Principle.
2) Determine the number of permutations of n elements taken r at a time.
3) Solve counting problems when two or more elements are identical.
4) Solve an equation involving permutations.
5) Determine the number of combinations of n elements taken r at a time.
6) Solve an equation involving combinations.
7) Expand $(x + y)^n$ using the binomial theorem.

EVALUATION:

Write the LG 18 assessment quiz.

RESOURCES NEEDED:

Math 12 Pre-Calc Text

Math 12 Pre-Calc Learning Guides.

sd42onlinemath.yolasite.com

LEARNING ACTIVITIES:

Expectation #1: Solve problems using the Fundamental Counting Principle.

Expectation #2: Determine the number of permutations of n elements taken r at a time.

Expectation #3: Solve counting problems when two or more elements are identical.

Expectation #4: Solve an equation involving permutations.

1. Watch and take notes on instructional video on Fundamental Counting Principle.

2. Watch and take notes on instructional video on Permutations.

3. Watch and take notes on instructional video on Pathways.

4. In the textbook, read Link the Ideas on page 517.
5. Work through Example 1 on pages 517-518 and complete the corresponding Your Turn questions.
6. Read the part on Factorial on the bottom of page 518 – 519.
7. Work through Example 2 on pages 519-520 and complete the corresponding Your Turn questions.
8. Read the part on Permutation with Repeating Objects on page 521.
9. Work through Example 3 & 4 on pages 521 - 522 and complete the corresponding Your Turn questions.
10. Read the part on Arrangements Requiring Cases on page 523.
11. Work through Example 5 on page 523 and complete the corresponding Your Turn questions.


12. Read Key Ideas on page 524. In your math journal, explain how the following using an example:
    1. The fundamental counting principle.
    2. Factorial notation.
    3. A permutation.
    4. A permutation involving identical objects.

13. In the textbook, complete pages 524 – 527 #1 – 8, 10 – 15, 19, 20, 24, 25, 31, C3.

Expectation #5: Determine the number of combinations of *n* elements taken *r* at a time.

Expectation #6: Solve an equation involving combinations.

1. Watch and take notes on instructional video on Combinations.

2. Read Link the Ideas on page 529 – 530.
3. Work through Examples 1 – 3 on pages 530 - 532 and complete the corresponding Your Turn questions.

4. Read Key Ideas on page 533. In your journal, explain using an example, the difference between a permutation and a combination. What formula is used to determine the combination of *n* objects taken *r* at a time?

5. In the textbook, complete pages 534 - 536 #1 – 6, 8, 10, 11, 14, 16 – 19, C1.

Expectation #7: Expand $(x + y)^n$ using the binomial theorem.

1. Watch and take notes on instructional video on the Binomial Theorem.
2. Read Link the Ideas on page 538.
3. Work through Example 1 on page 539 and complete the corresponding Your Turn questions.
4. Read the top part of page 540.
5. Work through Example 2 on pages 540 – 541 and complete the corresponding Your Turn questions.

6. Read Key Ideas on page 541. In your journal, describe how to expand the binomial $(x + y)^n$. Use an example to illustrate.

7. In the textbook, complete pages 542 - 545 #1 – 10, 17 – 19.

REVIEW AND CHALLENGE

1. In the textbook, complete Chapter 11 Review pages 546 - 547 #1 – 19.
2. Complete Chapter 11 Practice Test pages 548 #1 – 16.

Key Terms: fundamental counting principle, factorial, permutation, combination, Pascal's triangle, binomial theorem.

PRACTICE QUIZZES

Practice quiz #1
Practice quiz #2
Practice quiz #3
Practice quiz #4