

## Section 11.5 The Binomial Theorem

**Objective:** In this lesson you learned how to use the Binomial Theorem and Pascal's Triangle to calculate binomial coefficients and binomial expansions.

Course Number

Instructor

Date

### Important Vocabulary

Define each term or concept.

**Binomial coefficients**

**Pascal's Triangle**

### I. Binomial Coefficients (Pages 816–817)

List four general observations about the expansion of  $(x + y)^n$  for various values of  $n$ .

1)

2)

3)

4)

The **Binomial Theorem** states that in the expansion of  $(x + y)^n = x^n + nx^{n-1}y + \dots + {}_nC_r x^{n-r}y^r + \dots + nxy^{n-1} + y^n$ , the coefficient of  $x^{n-r}y^r$  is \_\_\_\_\_.

**Example 1:** Find the binomial coefficient  ${}_{12}C_5$ .

#### *What you should learn*

How to use the Binomial Theorem to calculate binomial coefficients

### II. Pascal's Triangle (Page 818)

Construct rows 0 through 6 of Pascal's Triangle.

#### *What you should learn*

How to use Pascal's Triangle to calculate binomial coefficients

**III. Binomial Expansions** (Pages 819–820)

Writing out the coefficients for a binomial that is raised to a power is called \_\_\_\_\_.

***What you should learn***

How to use binomial coefficients to write binomial expansions

**Example 2:** Use the binomial coefficients from the appropriate row of Pascal's Triangle to expand  $(x + 2)^5$

**Additional notes****Homework Assignment**

Page(s)

Exercises