Expanding Binomials
ExpandingBinomials.tns

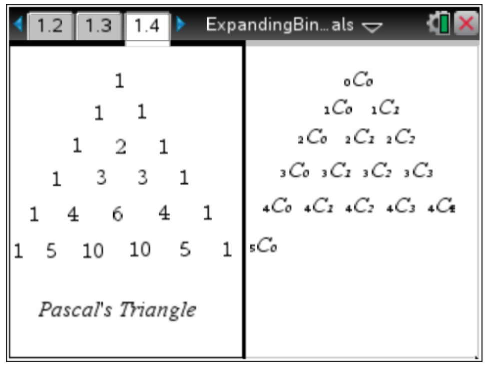
Name ______________________

Class ______________________

Problem 1 – Exploring $(x + b)^n$

On the right side of page 1.4, use the **Text** tool **(MENU > Actions > Text)** to complete the triangle using combination notation.

The small subscript numbers can be entered by selecting them from the Symbols menu (ctrl).



Expand the binomials on page 1.6 using the **Expand** command. Use a Math Box to calculate your answers (**MENU > Insert > Math Box** or ctrl M). The command for the first binomial has already been entered in a Math Box for you.

- When the binomials are expanded, what do you notice about the coefficients? The exponents?

- Expand the binomials on page 1.8. What effect does *b* have on the expanded binomial?

- Rewrite $1 \cdot x^3 + 3 \cdot b \cdot x^2 + 3 \cdot b^2 \cdot x + 1 \cdot b^3$ using combination notation.

Problem 2 – Exploring $(ax + 1)^n$

On pages 2.2 and 2.3, expand the given binomials. Make sure to place a multiplication symbol between *a* and *x*.

- What effect does *a* have on the expanded binomial?

- Rewrite $(a \cdot x + 1)^4$ in expanded form using Pascal's triangle.

- Rewrite $(a \cdot x + 1)^4$ in expanded form using combination notation.

Problem 3 – Exploring $(ax + b)^n$

On pages 3.2 and 3.3, expand the given binomials.

- What is the pattern involving *a* and *b* in $(ax+b)^n$?

- Write the expansion of the following binomials using combination notation. Remember that the first and last term have coefficients of 1.

  $(ax+b)^0 =$

  $(ax+b)^1 =$

  $(ax+b)^2 =$

  $(ax+b)^3 =$

- The pattern established in this problem can be generalized as the Binomial Theorem. State the Binomial Theorem by writing the first two and last two terms of the expanded binomial $(ax+b)^n$ using combination notation.

  $(ax+b)^n =$

Extra Problems

Use the Binomial Theorem to expand the following binomials.

1. $(6x + 1)^5$

2. $(x + 7)^6$

3. $(3x + 5)^4$

4. $(7x + 4)^8$