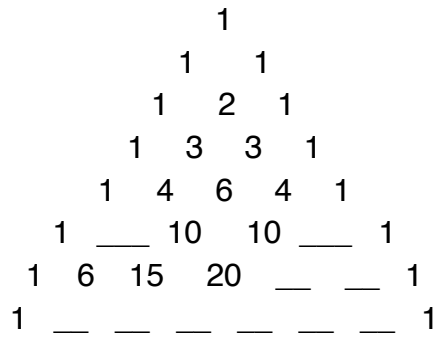


Name: _____

Classwork 1

1. Fill in the blanks with numbers to complete the pattern.



What pattern or patterns did you notice that allowed you to fill in the blanks?

2. Distribute. $(a + b)(c + d + f + g)$

3. Expand (multiply out/ FOIL) the following expressions.

a) $(x + 1)^2 =$

b) $(x + 1)^3 =$

c) $(x + 1)^4 =$

d) $(x + 1)^4 =$

e) $(x + 1)^5 =$

b) $(a + b)^3 =$

What do you notice?

4. Evaluate the following combinations.

a) ${}^5nCr\ 0 =$

b) ${}_5C_1 =$

c) $\binom{5}{2} =$

d) ${}^5nCr\ 3 =$

e) ${}^5nCr\ 4 =$

f) ${}^5nCr\ 5 =$

What do you notice?

5. Why is Pascal's triangle connected to expressions like $(x + 1)^5$? (this is called *binomial expansion*)

In order to figure this out let's follow the following rules:

- 1) We will find each new expansion from the previous one.
- 2) We'll write the "times x" part on one line and the "times 1" part on the line below it.
- 3) When we write the second line, we'll line up like terms vertically.

6. Why are combinations related to binomial expansion?

In order to figure this out, let's try expanding

$$(a + b)(c + d)(f + g)(x + y)$$

Practice Problems

1. Write the 10th row of Pascal's triangle. (The single 1 is the first row, "1 1" is the second...)
2. Expand the following expressions:
 - a) $(x + 1)^6$
 - b) $(x + 1)^7$
 - c) $(x + 1)^8$

Justify each answer (show work or provide an explanation of some kind).