

Expanding Binomials using Pascal's triangle: $(a + b)^n$ Steps with Example: $(x + 3)^4$

Step 1: Identify the power of the binomial

The power is 4

Step 2: Locate the row of the triangle we are going to use based on the power of the binomial

Row 4

Step 3: List the coefficients and their signs

1 +4 +6 +4 +1

Step 4: Identify the first term

The first term is x

Step 5: Write the first term after each coefficient and raise it to the power in decreasing order starting with the power of the binomial

$$1(x)^4 + 4(x)^3 + 6(x)^2 + 4(x)^1 + 1(x)^0$$

Step 6: Identify the second term

The second term is 3

Step 7: Multiply the second term after the first term and raise it to the powers in ascending order starting with 0

$$1(x)^4(3)^0 + 4(x)^3(3)^1 + 6(x)^2(3)^2 + 4(x)^1(3)^3 + 1(x)^0(3)^4$$

Step 8: Simplify

$$1(x)^4 + 12(x)^3 + 54(x)^2 + 108(x)^1 + 81$$