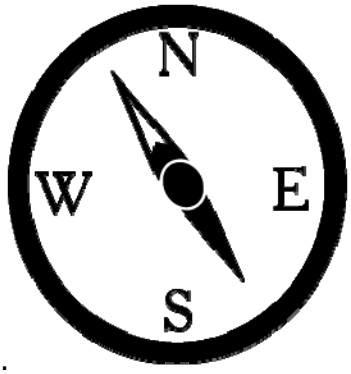
Name _____ Date _____

Binomial Theorem for Expansion - Step-by-Step Lesson

Use the Binomial Theorem to expand the binomial:

$(3x + 4y)^4$



Explanation:

Binomial expressions contain two terms.

The first terms is seen as a^n and the last term is seen as b^n.

When binomial expressions are raised to a power, they can be expanded using the following expansion formulas.

$(a + b)^0 = 1$

$(a + b)^1 = a + b$

$(a + b)^2 = a^2 + 2ab + b^2$

$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

In this case, the binomial is raised to the fourth power, so we will use this formulae:

$(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$

We will insert our values into the formula:

$(3x)^4 + 4(3x)^3\ 4y + 6\ (3x)^2(4y)^2 + 4(3x)(4y)^3 + (4y)^4$

$81x^4 + 432x^3y + 864x^2y^2 + 768xy^3 + 256y^4$