Name _____
Date _____ Period _____

Binomial Theorem

expanding a binomial raised to the n^{th} degree

$(x + 3)^2$

$(x + 3)(x + 3)$

$x^2 + 3x + 3x + 9$

$x^2 + 6x + 9$

$(x + 3)^4$

$(x + 3)(x + 3)(x + 3)(x + 3)$

Binomial Theorem

expanding a binomial raised to the n^{th} degree

$$(x + a)^n = \binom{n}{0}a^0x^n + \binom{n}{1}ax^{n-1} + \ldots + \binom{n}{j}a^jx^{n-j} + \ldots + \binom{n}{n}a^nx^0$$

$(x + 3)^4$

Binomial Theorem

expanding a binomial raised to the n^{th} degree

$$(x + a)^n = \binom{n}{0}a^0x^n + \binom{n}{1}ax^{n-1} + \ldots + \binom{n}{j}a^jx^{n-j} + \ldots + \binom{n}{n}a^nx^0$$

$(x + 4)^5$

$$\binom{0}{0}$$

$$\binom{1}{0}\ \binom{1}{1}$$

$$\binom{2}{0}\ \binom{2}{1}\ \binom{2}{2}$$

$$\binom{3}{0}\ \binom{3}{1}\ \binom{3}{2}\ \binom{3}{3}$$

$$\binom{4}{0}\ \binom{4}{1}\ \binom{4}{2}\ \binom{4}{3}\ \binom{4}{4}$$

$$\binom{5}{0}\ \binom{5}{1}\ \binom{5}{2}\ \binom{5}{3}\ \binom{5}{4}\ \binom{5}{5}$$

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

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Binomial Theorem

expanding a binomial raised to the n^{th} degree

$\binom{4}{0}$ $\binom{4}{1}$ $\binom{4}{2}$ $\binom{4}{3}$ $\binom{4}{4}$ $n = 4$ 1 4 6 4 1

$(x + 3)^4$

Binomial Theorem

expanding a binomial raised to the n^{th} degree

$\binom{5}{0}$ $\binom{5}{1}$ $\binom{5}{2}$ $\binom{5}{3}$ $\binom{5}{4}$ $\binom{5}{5}$ $n = 5$ 1 5 10 10 5 1

$(x + 4)^5$

Binomial Theorem

expanding a binomial raised to the n^{th} degree

$\binom{3}{0}$ $\binom{3}{1}$ $\binom{3}{2}$ $\binom{3}{3}$ $n = 3$ 1 3 3 1

$(2x - 5)^3$