

BINOMIAL EXPANSION THEOREM

$$(x+y)^0 = 1$$

$$(x+y)' = x+y$$

$$(x+y)^2 = x^2 + 2xy + y^2$$

$$(x+y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$$

$$(x+y)^4 = x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4$$

Pascal's Δ

Row 0

Row 1

Row 2

Row 0

Row 1

Row 2

Row 3

Row 4

Row 5

C_0 $5C_1$ $10C_2$ $10C_3$ $5C_4$ $1C_5$

$\frac{5!}{3!2!}$ $\frac{5!}{2!3!}$

Eighth Row

$$(3x-2y)^4 =$$

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

$$4 \cdot 3^3 \cdot -2 \quad 6 \cdot 3^2 \cdot (-2)^2 \quad 4 \cdot 3 \cdot (-2)^3$$

$$81x^4 - 216x^3y + 216x^2y^2 - 96xy^3 + 16y^4$$

1st ~~108x³-2y~~ 2nd 3rd 4th 5th

Find the 4th term of $(3x-2y)^4$

$${}^4C_3 (3x)^1 (-2y)^3$$

$${}^4C_3 \cdot 3^1 \cdot (-2)^3 =$$

$$-96xy^3$$

Find the 7th term of $(5x-4y)^{10}$

$${}^{10}C_6 (5x)^4 (-4y)^6$$

$$= 537,600,000 x^4 y^6$$

BINOMIAL PROBABILITY

* 2 possible outcomes

* Independent events (same chance every time)

Giveaways

- * Give prob in problem
- * Repeat the same action multiple times

Kirby Kicker = makes 65% of his field goals under 40 yds

What is prob. he make exactly 5 of his next 7 attempts?

${}^7C_2 G^5 M^2$

$${}^7C_2 (0.65)^5 (0.35)^2 \approx 0.298$$

10 Questions — Multiple choice
A-D

What is probability of 6 right?

$${}_{10}C_4 R^6 W^4$$

$${}_{10}C_4 (0.25)^6 (0.75)^4 \approx 0.0162$$