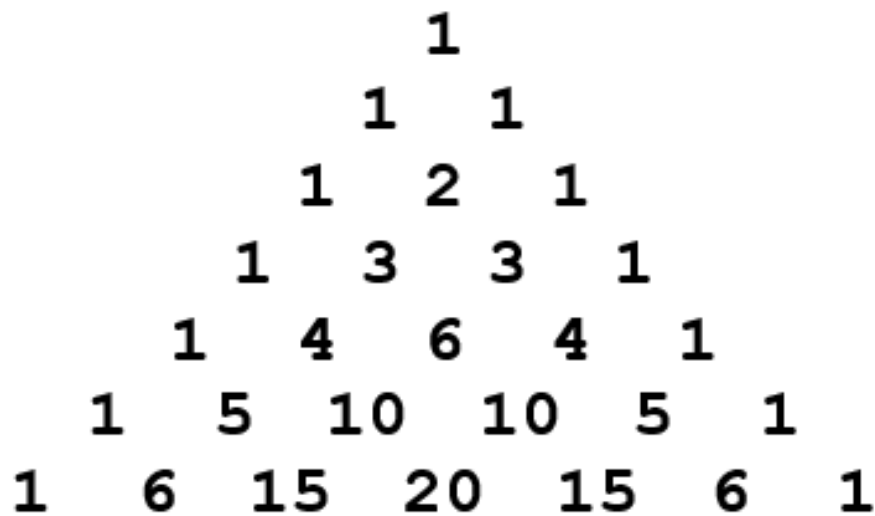


Binomial expansion

Binomial theorem

$$(a + b)^n = a^n + \binom{n}{1}a^{n-1}b + \dots + \binom{n}{r}a^{n-r}b^r + \dots + b^n$$

Pascal's triangle



Number of terms = $n + 1$

Binomial expansion

1. Expand $(3x + 4)^3$.

2. Expand $(4x + 4)^4$.

Binomial coefficient

$$\left| \binom{n}{r} = \frac{n!}{r!(n-r)!} \right.$$

Paper 1 skill

$$n! = n \times (n - 1) \times (n - 2) \times (n - 3) \times \dots \times 3 \times 2 \times 1$$

$$4! = 4 \times 3 \times 2 \times 1$$

$$7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

1. Find the value of $\binom{11}{8}$.

2. Find the value of $\binom{7}{3}$.

Paper 2 GDC Skill

$$\binom{n}{r} = nCr$$

Casio

OPTN → F6 → F3 PROB → F3 nCr

TI-84

2nd → Math → PROB → 3: nCr

TI-nspire

Menu → 5: Probability → 3: Combinations

e.g. $\binom{9}{4}$

nCr (9, 4)

Find the n^{th} term

The n^{th} term is $T_{r+1} = \binom{n}{r} a^{n-r} b^r$

1. Find the 5^{th} term of $(4x + \frac{2}{x})^7$.

2. Find the 7^{th} term of $(2x^2 + \frac{6}{x})^7$.
