

Precalculus - The Binomial Theorem - Worksheet

Common Core A-APR.C.5 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice the Binomial Theorem (Common Core A-APR.C.5). You will use factorials and binomial coefficients, read Pascal's triangle, expand binomials, find single terms and solve counting and probability problems.

Precalculus · Common Core State Standards: **A-APR.C.5**

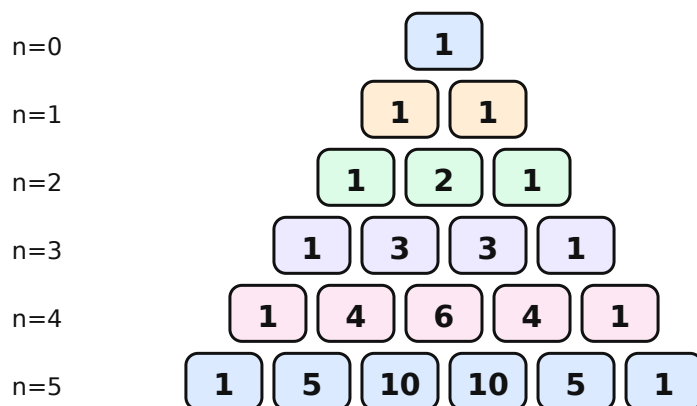
Exercise 1 - Factorials

Evaluate $6!$, $0!$ and $\frac{8!}{6!}$.

Exercise 2 - Binomial coefficients

Evaluate $C(7,3)$, $C(10,2)$, $C(9,9)$ and $C(12,10)$.

Exercise 3 - Pascal's triangle



Rows 0 through 5.

Use the triangle to write row 6.

Exercise 4 - Expand $(x + y)^4$

Expand $(x+y)^4$.

Exercise 5 - Expand $(x + 2)^5$

k	0	1	2	3	4	5
$C(5,k)$	1	5	10	10	5	1
$x^{(5-k)}$	x^5	x^4	x^3	x^2	x	1
2^k	1	2	4	8	16	32
term	$1x^5$	$10x^4$	$40x^3$	$80x^2$	$80x$	32

Terms of $(x + 2)^5$.

Expand $(x+2)^5$.

Exercise 6 - Expand $(3x + 1)^4$

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

Exercise 7 - Expand $(x - 3)^3$

Expand $(x-3)^3$.

Exercise 8 - Find a single term

Find the 4th term of $(x+3)^8$.

Exercise 9 - Find a coefficient

Find the coefficient of x^3 in $(2x+1)^6$.

Exercise 10 - Coefficient with a negative

Find the coefficient of x^4 in $(x-2)^7$.

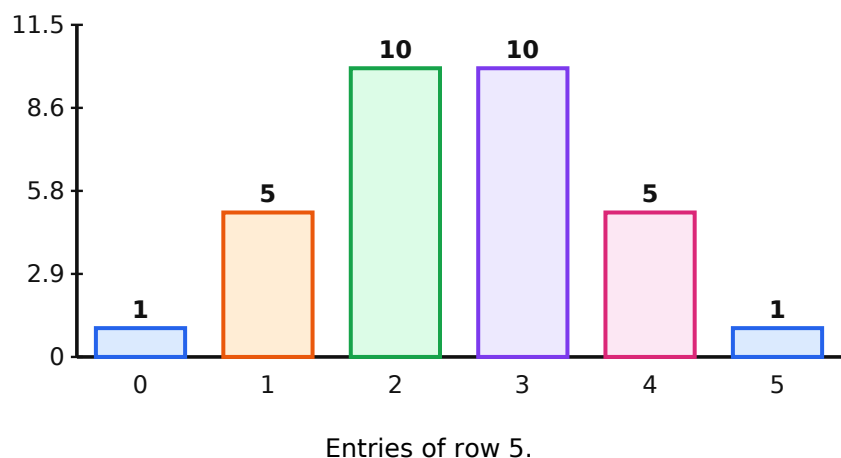
Exercise 11 - Constant term

Find the constant term in $\left(x + \frac{2}{x}\right)^6$.

Exercise 12 - Sum of coefficients

Find the sum of the coefficients of $(3x-1)^5$.

Exercise 13 - Row sums



Add the entries of row 5 of Pascal's triangle and compare with 2^5 .

Exercise 14 - Middle term

Find the middle term of $(x+y)^{10}$.

Exercise 15 - Approximate a power

Use the first four terms of $(1+0.02)^5$ to approximate 1.02^5 . Compare with a calculator value 1.10408.

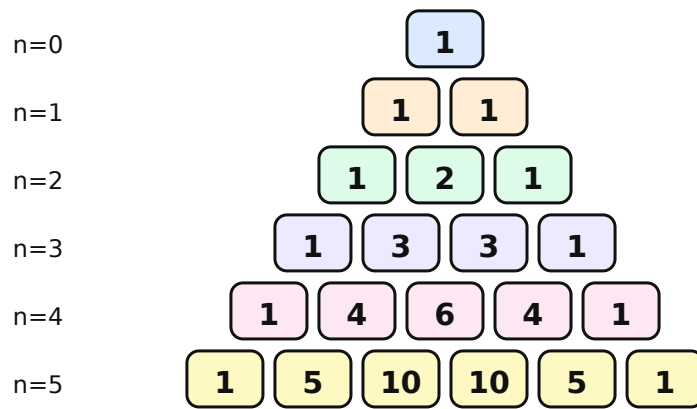
Exercise 16 - Complex number

Use the Binomial Theorem to find $(1+i)^4$.

Exercise 17 - Choose a committee

A teacher chooses 3 of 8 students for a committee. How many different committees are possible?

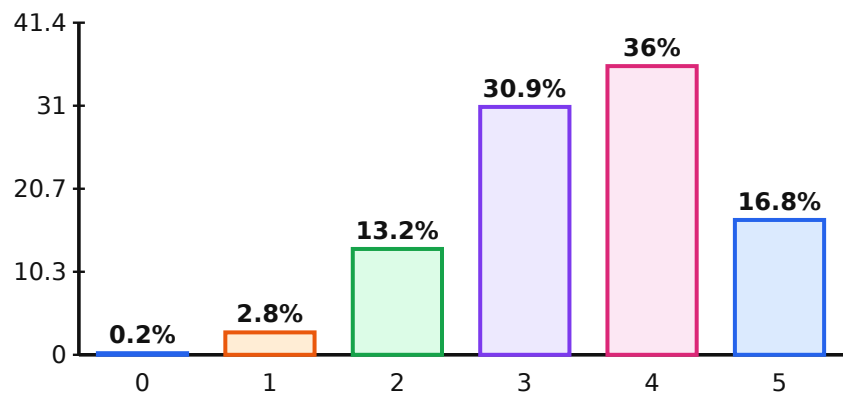
Exercise 18 - Coin tosses



Row 5 counts outcomes of 5 tosses.

Find the probability of exactly 3 heads in 5 tosses of a fair coin.

Exercise 19 - Free throws



Probability of k made shots out of 5.

Mei makes 70% of her free throws. Find the probability that she makes exactly 4 of 5 shots.

Exercise 20 - Two variables

Expand $(2x-3y)^4$.