

Precalculus - The Binomial Theorem - Quiz

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

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

Pick the best answer for 10 questions on binomial coefficients and expansions. Explanations name typical errors, such as forgetting to raise the coefficient of x to a power.

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

Questions

Question 1

What is $5!$?

- A. 25
- B. 60
- C. 720
- D. 120

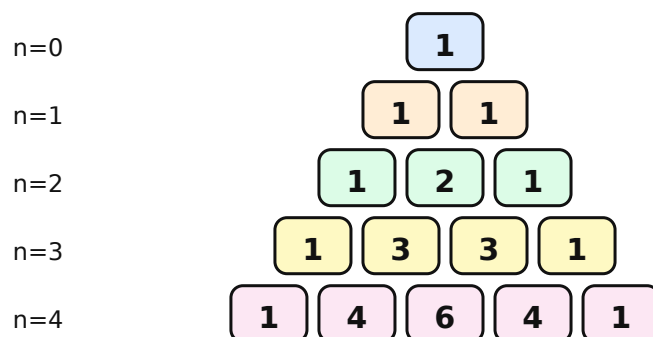
Question 2

What is $C(6,2)$?

- A. 12
- B. 30
- C. 15
- D. 36

Question 3

What is the next row of Pascal's triangle after 1,3,3,1?



Rows 0 to 4.

- A. 1,4,4,4,1
- B. 1,5,6,5,1
- C. 1,4,6,4,1
- D. 1,3,6,3,1

Question 4

How many terms does $(x+y)^8$ have?

- A. 8
- B. 9
- C. 7
- D. 10

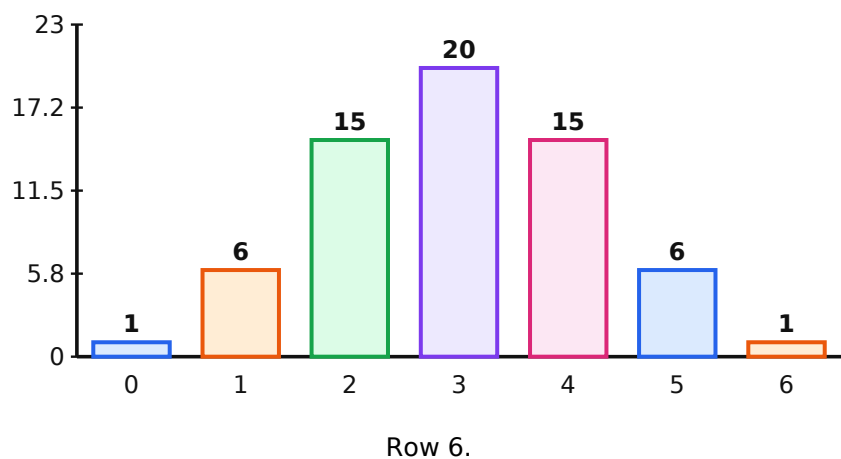
Question 5

What is the coefficient of x in $(x+4)^3$?

- A. 48
- B. 12
- C. 64
- D. 24

Question 6

What is the sum of the entries in row 6 of Pascal's triangle (see the bars)?



- A. 36
- B. 64
- C. 12
- D. 32

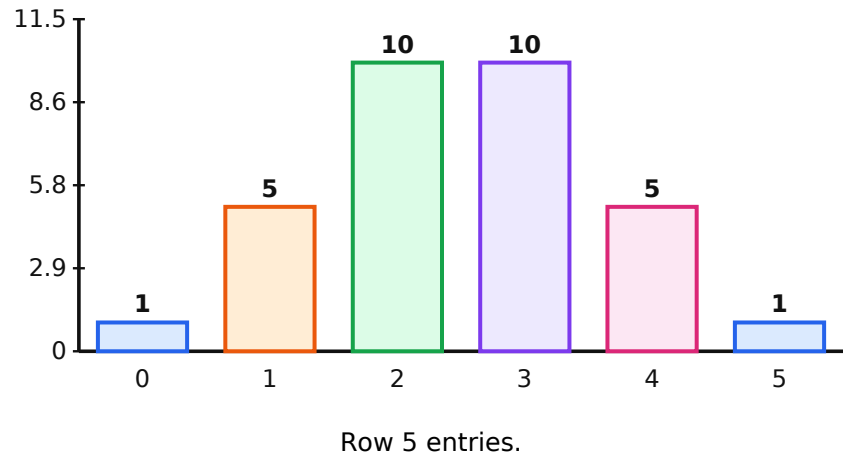
Question 7

Which is the expansion of $(a-b)^3$?

- A. $a^3 - 3a^2b + 3ab^2 - b^3$
- B. $a^3 - b^3$
- C. $a^3 + 3a^2b + 3ab^2 + b^3$
- D. $a^3 - 3a^2b - 3ab^2 - b^3$

Question 8

The bar chart shows row 5 of Pascal's triangle. What is the largest entry?



- A. 5
- B. 10
- C. 32
- D. 20

Question 9

How many ways can you choose 2 of 5 books?

- A. 20
- B. 25
- C. 7
- D. 10

Question 10

Which term of $(x+2)^5$ contains x^3 ?

- A. $40x^3$
- B. $10x^3$
- C. $80x^3$
- D. $20x^3$

Answers

1. **D** - $5! = 5 \text{ times } 4 \text{ times } 3 \text{ times } 2 \text{ times } 1 = 120$.
2. **C** - $C(6, 2) = 6 \text{ times } 5 \text{ divided by } 2 = 15$. Multiplying 6 times 5 without dividing gives 30.
3. **C** - Add adjacent entries: $1, 3 + 1 = 4, 3 + 3 = 6, 1 + 3 = 4, 1$.
4. **B** - There are $n + 1$ terms, one for each k from 0 to 8.
5. **A** - $C(3, 2) \text{ times } 4^2 = 3 \text{ times } 16 = 48$.
6. **B** - Row n sums to 2^n , and $2^6 = 64$.
7. **A** - The signs alternate because b is negative: odd powers of b are negative.
8. **B** - The row is 1, 5, 10, 10, 5, 1, so the largest entries are 10.
9. **D** - $C(5, 2) = 10$. Order does not matter, so we do not use 5 times 4.
10. **A** - $C(5, 2) \times 3 \times 2^2 = 10 \text{ times } 4 = 40$. Leaving out the power of 2 gives 10.

Remember

- $n! = n(n - 1)\dots(1)$ and $0! = 1$; $C(n, k) = n!/(k!(n - k)!)$.
- Pascal's triangle: each entry is the sum of the two above; row n sums to 2^n .
- $(a + b)^n = \text{sum of } C(n, k) a^{(n-k)} b^k \text{ for } k = 0 \text{ to } n$.
- The general term is $T(k+1) = C(n, k) a^{(n-k)} b^k$; signs alternate when b is negative.
- Setting $x = 1$ gives the sum of the coefficients.