



Row Number

0

1

2

3

4

5

6

7

8

9

10

											Row Number									
1											0									
0C_0																				
1		1									1									
1C_0		1C_1																		
1	2		1								2									
2C_0	2C_1		2C_2																	
1	3		3		1						3									
3C_0	3C_1		3C_2		3C_3															
1	4		6		4		1				4									
4C_0	4C_1		4C_2		4C_3		4C_4													
1	5		10		10		5		1		5									
5C_0	5C_1		5C_2		5C_3		5C_4		5C_5											
1	6		15		20		15		6		1	6								
6C_0	6C_1		6C_2		6C_3		6C_4		6C_5		6C_6									
1	7		21		35		35		21		7		1	7						
7C_0	7C_1		7C_2		7C_3		7C_4		7C_5		7C_6		7C_7							
1	8		28		56		70		56		28		8		1	8				
8C_0	8C_1		8C_2		8C_3		8C_4		8C_5		8C_6		8C_7		8C_8					
1	9		36		84		126		126		84		36		9		1	9		
9C_0	9C_1		9C_2		9C_3		9C_4		9C_5		9C_6		9C_7		9C_8		9C_9			
1	10		45		120		210		252		210		120		45		10		1	10
${}^{10}C_0$	${}^{10}C_1$		${}^{10}C_2$		${}^{10}C_3$		${}^{10}C_4$		${}^{10}C_5$		${}^{10}C_6$		${}^{10}C_7$		${}^{10}C_8$		${}^{10}C_9$		${}^{10}C_{10}$	

SOLUTIONS \Rightarrow PASCAL'S TRIANGLE

1. 1 7 21 35 35 21 7 1

a) This is the seventh row. It can be identified because the second number in the row is the same as the row number.

b) Next Row \rightarrow 1 8 28 56 70 56 28 8 1

2. 1 10 45 120 210 252 210

a) This is not an entire row since it is not symmetrical about the middle number. (It also does not end in 1.)

b) 1 10 45 120 210 252 210 120 45 10 1

c) Previous Row.

1 9 36 84 126 126 84 36 9 1

Next Row

1 11 55 165 330 462 462 330 165 55 11 1

$$\begin{array}{l}
 \textcircled{3} \text{ a) } i = 2 \text{ (element)} \quad nC_{i-1} \\
 \quad \quad \quad n = 6 \text{ (row)} \quad 6C_{2-1} \\
 \quad \quad \quad \quad \quad \quad 6C_1 \\
 \quad \quad \quad \quad \quad \quad 6
 \end{array}$$

$$\begin{array}{l}
 \text{b) } i = 5 \text{ (element)} \quad nC_{i-1} \\
 \quad \quad \quad n = 6 \text{ (row)} \quad 6C_{5-1} \\
 \quad \quad \quad \quad \quad \quad 6C_4 \\
 \quad \quad \quad \quad \quad \quad 15
 \end{array}$$

3.a) 2nd element in row 6.

$$n=6 \quad i=2$$

$$= {}_n C_{i-1}$$

$$= {}_6 C_{2-1}$$

$$= {}_6 C_1$$

$$= 6$$

b) 5th element in row 6.

$$n=6 \quad i=5$$

$$\begin{aligned} & n C_{i-1} \\ &= {}_6 C_{5-1} \\ &= {}_6 C_4 \\ &= 15 \end{aligned}$$

c) 1st 3 elements in row 11.

$$\begin{aligned} & n=11 \\ & i=1 \end{aligned}$$

$$\begin{aligned} & n C_{i-1} \\ &= {}_{11} C_{1-1} \\ &= {}_{11} C_0 \\ &= 1 \end{aligned}$$

$$\begin{aligned} & n=11 \\ & i=2 \end{aligned}$$

$$\begin{aligned} & n C_{i-1} \\ &= {}_{11} C_{2-1} \\ &= {}_{11} C_1 \\ &= 11 \end{aligned}$$

$$\begin{aligned} & n=11 \\ & i=3 \end{aligned}$$

$$\begin{aligned} & n C_{i-1} \\ &= {}_{11} C_{3-1} \\ &= {}_{11} C_2 \\ &= 55 \end{aligned}$$

d) 4th element in row 8.

$$n = 8 \quad i = 4$$

$$\begin{aligned} & n C_{i-1} \\ = & 8 C_{4-1} \\ = & 8 C_3 \\ = & 56 \end{aligned}$$

e) 60th element in row 60.

$$n = 60 \quad i = 60$$

$$\begin{aligned} & n C_{i-1} \\ = & 60 C_{60-1} \\ = & 60 C_{59} \\ = & 60 \end{aligned}$$

f) 8th element in row 10.

$$n=10 \quad i=8$$

$$nC_{i-1}$$

$$= 10C_{8-1}$$

$$= 10C_7$$

$$= 120$$

g) 20th element of row 17.

$$n=17 \quad i=20$$

$$nC_{i-1}$$

$$= 17C_{20-1}$$

$$= 17C_{19}$$

↳ This is not possible!

Row 17 only has 18 elements

4. In Pascal's Triangle, the values increase toward the middle of any row, where "r" approaches one-half of "n".