

# Right Half of Pascal's Triangle

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## ABSTRACT

In this short paper I present a closed form formula for the right half of Pascal's triangle.

Pascal's triangle is, which I will show up to the 6<sup>th</sup> row.

$$\begin{array}{cccccc} & & & & & & 1 \\ & & & & & & & 1 \\ & & & & & & 1 & 2 & 1 \\ & & & & & 1 & 3 & 3 & 1 \\ & & & & 1 & 4 & 6 & 4 & 1 \\ & & 1 & 5 & 10 & 10 & 5 & 1 \end{array}$$

The formula will give the right half, which is

$$\begin{array}{r} 1 \\ 1 \\ 2 \quad 1 \\ 3 \quad 1 \\ 6 \quad 4 \quad 1 \\ 10 \quad 5 \quad 1 \end{array}$$

The formula which I present here, is in two parts.

$$Rows = \left( \frac{r-1}{\frac{2r+1-(-1)^r}{4}-n} \right)$$

Where  $r$  is the row number and  $n$  is the term.

$$columns = \left( \frac{2m + c}{m - 1} \right)$$

Where  $c$  is the column number, with center column having value 1, and  $m$  is the term.

Note that if trying to find the second term of the half triangle for row 6, you will get 5 from the row formula as you should. But, this number is the second term of column 4 when using the column formula, which can be seen by referring to Pascal's triangle.