



### Summary

- Each term of Pascal's triangle is the sum of the terms directly above, from the left and right
- In the circled example above, 210 is the element in row  $n = 10$  and "column"  $r = 4$ . This element can be calculated using the combinations button on one's calculator,  $\boxed{{}_n C_r}$ .
- Pascal's Theorem generates the terms of Pascal's triangle recursively:

$$t_{n,r} + t_{n,r+1} = t_{n+1,r+1}, \text{ where } t_{n,r} \text{ represents the } r^{\text{th}} \text{ term in row } n.$$

- Pascal's triangle is symmetric
- The sum of the terms in row  $n$  of Pascal's triangle is  $2^n$

- Triangular numbers:

$$\text{The } n^{\text{th}} \text{ triangular number, } t_n = \frac{n(n+1)}{2}$$

- "Matches" numbers:  $t_n = \frac{3n(n+1)}{2}$
- Tetrahedral numbers:  $t_n = \frac{n(n+1)(n+2)}{6}$