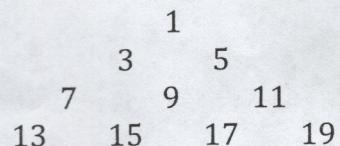


Analysis H - Deggeller / Hahn/Gleason 18-19 Welcome to Pascalifornia! _____
Unit 1, Quiz 1 - ATPS [30 pts] Period: _____
NO CALCULATORS, but feel free to leave answers unsimplified.

1. Consider the odd number triangle we studied in class, starting with row 1.



- a) Name the middle term of the 55th row. _____ [2]
- b) How many terms (total) are in the first 9 rows of the triangle? _____ [3]
- c) In class we proved that the first term of the nth row is $n^2 - n + 1$. Knowing this, find an expression for the last term of the nth row. [3]
2. Fill in the blanks. [3 each]

a) $F_{25} = \underline{\quad} F_{20} + \underline{\quad} F_{19}$

b) $F_{217} = F_{\underline{\quad}} - F_{\underline{\quad}} \quad \text{or} \quad F_{\underline{\quad}} - F_{\underline{\quad}}$

3. Briefly explain the relationship between the Fibonacci Numbers and the Golden Ratio using words, mathematical symbols and/or pictures. [3]

4. Evaluate each, leaving your answer in terms of choose numbers or whole numbers [3 each]

a) $\binom{142}{35} + \binom{142}{36} =$ _____

b) $\binom{n}{1} + \binom{n}{3} + \binom{n}{5} + \dots + \binom{n}{n} =$ _____
(assume n is an odd number bigger than 5)

c) $\binom{42}{40} + \binom{43}{40} + \binom{44}{40} + \dots + \binom{104}{40} =$ _____

5. Choose 1 of the following 2 problems to do. Circle the problem you want me to grade. [4]

a) Find a compact (simplified) expression for the sum of the first n Fibonacci numbers.

OR

b) There is a family of numbers called pentagonal numbers, the first 6 of which are:

1, 5, 12, 22, 35, 51..... Find an expression for the nth pentagonal number.