

Combinatorics and Problem Solving

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Sequences

1.) Find a formula a_n , where $n = 1, 2, 3, 4, \dots$, for each of the following sequences.

a.) $1, 3, 5, 7, 9, \dots$

b.) $2, 4, 6, 8, 10, \dots$

c.) $1, 4, 9, 16, 25, \dots$

d.) $3, 7, 11, 15, 19, \dots$

e.) $4, 12, 36, 108, 324, \dots$

f.) $2, 12, 36, 80, 150, \dots$

g.) $2, 6, 12, 20, 30, \dots$

h.) $2, 12, 30, 56, 90, \dots$

i.) $1, -1, 1, -1, 1, \dots$

j.) $4, 8, 4, 8, 4, \dots$

k.) $0, 0, 2, 6, 12, 20, 30, \dots$

l.) $4/3, 7/7, 10/11, 13/15, 16/19, 19/23, \dots$

m.) $-1/9, 1/3, -1, 3, -9, 27, -81, \dots$

(FACT : $1 + 2 + 3 + 4 + \dots + n = (1/2)n(n + 1)$)

n.) $1, 3, 6, 10, 15, 21, 28, \dots$

o.) $4, 8, 13, 19, 26, 34, 43, \dots$

2.) Determine how many numbers are in each list.

a.) $2, 4, 6, 8, 10, \dots, 9864$

d.) $3^7, 3^{11}, 3^{15}, 3^{19}, \dots, 3^{203}$

b.) $55, 57, 59, 61, 63, \dots, 637$

e.) $3, 6, 10, 15, 21, \dots, 1891$

c.) $1, 2, 4, 7, 8, 10, 13, 14, 16, \dots, 601, 602, 604$