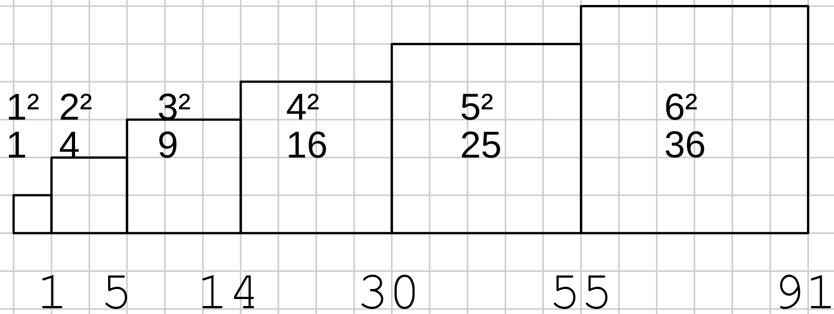
Somma dei quadrati dei numeri interi vista come figura piana

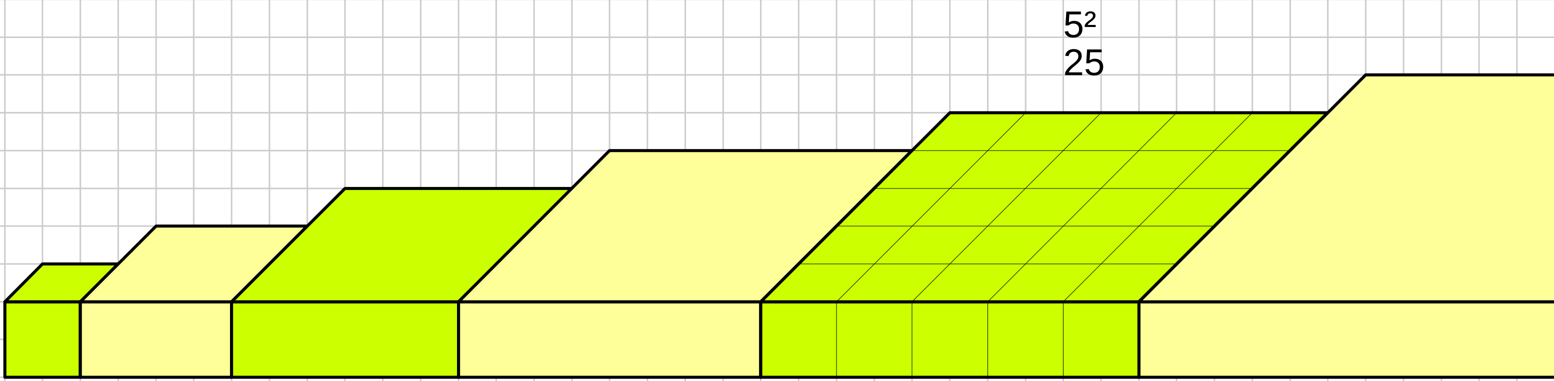


$1^2+2^2+3^2+...+n^2 = Sn$

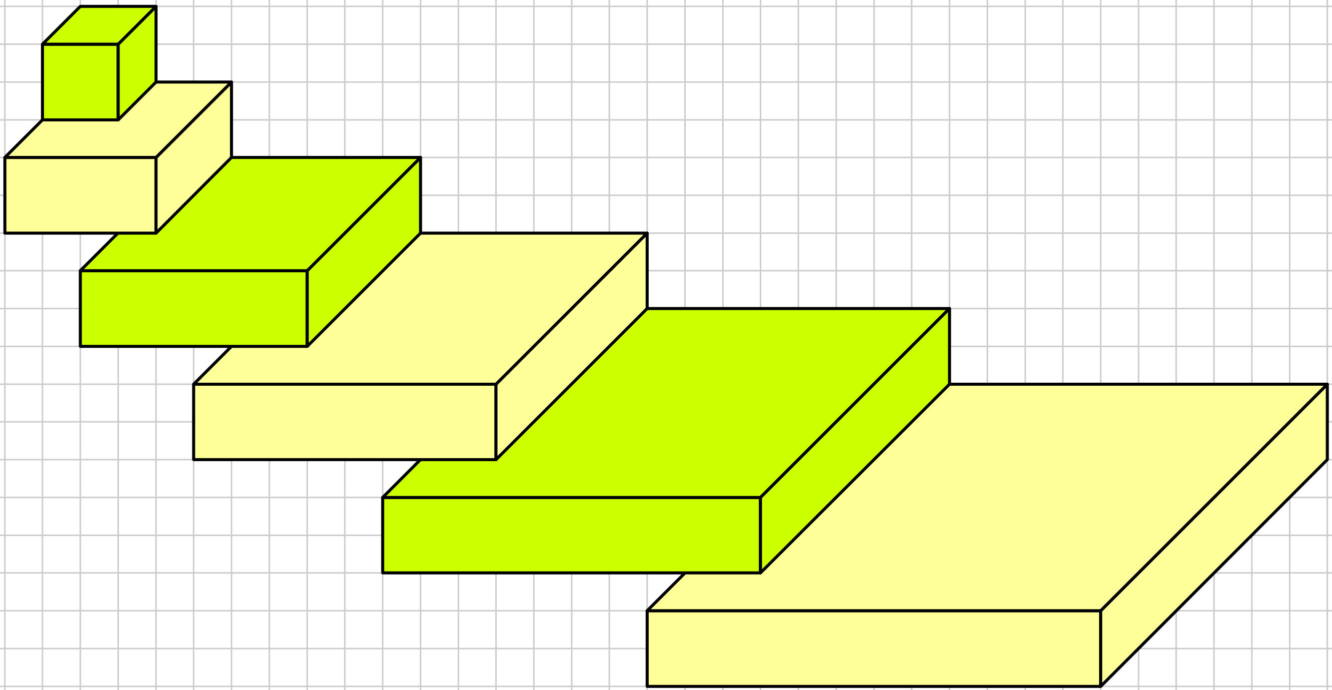
$S(n+1)= Sn+(n+1)^2$

$S(n-1)= Sn-n^2$

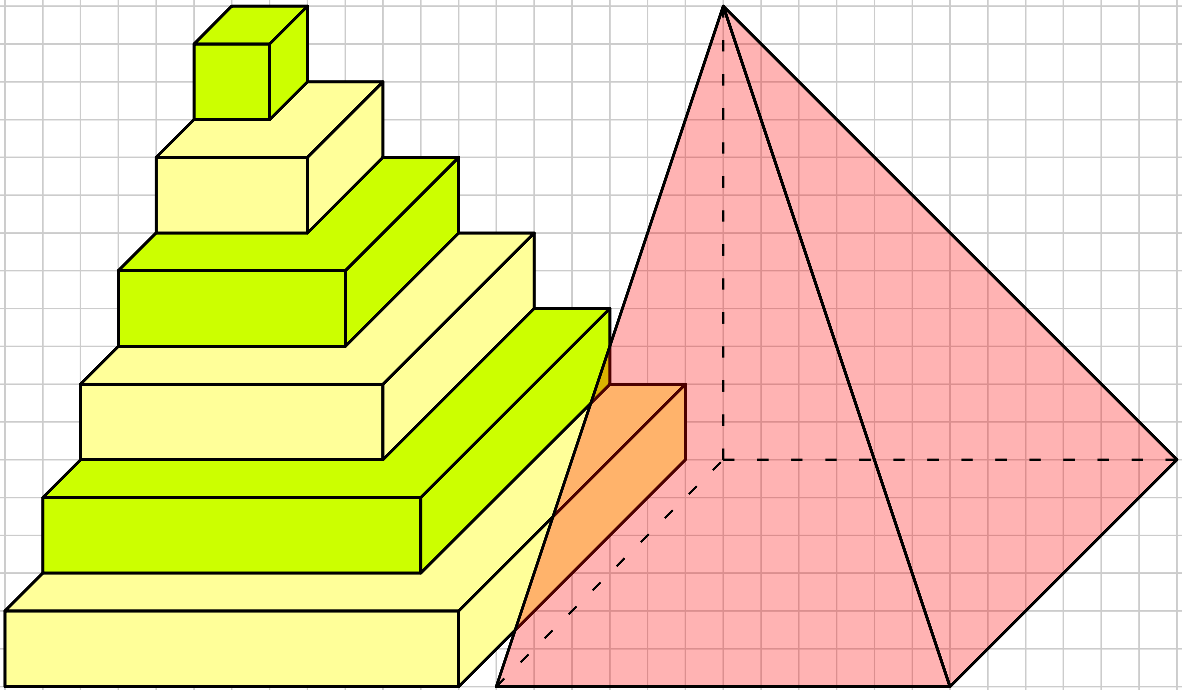
Somma dei quadrati dei numeri interi



Somma dei quadrati dei numeri interi vista come piramide.



Somma dei quadrati dei numeri interi
vista come piramide.

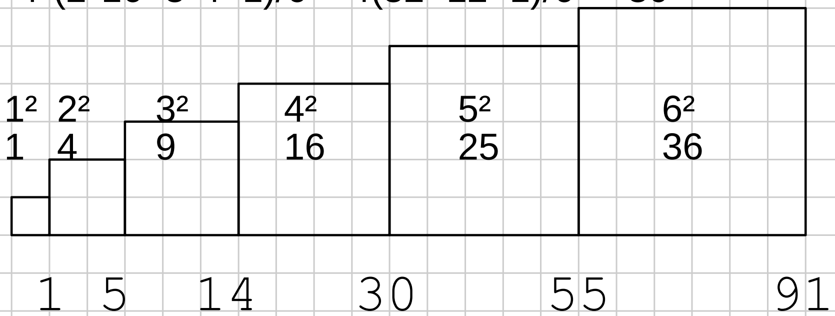


Formula, e verifica in alcuni casi.

$Sn = n^3/3 + n^2/2 + n/6$ bella da vedere

$= n(2n^2+3n+1)/6$ comoda da calcolare

S0= 0+ 0 +0
S1= 1/3+1/2+1/6 = 2/6+3/6+1/6 = 6/6 = 1
S2= 2*(2*4+3*2+1)/6 = 2*15/6 = 5
S3= 3*(2*9+3*3+1)/6 = 3*28/6 = 14
S4= 4*(2*16+3*4+1)/6 = 4(32+12+1)/6 = 30



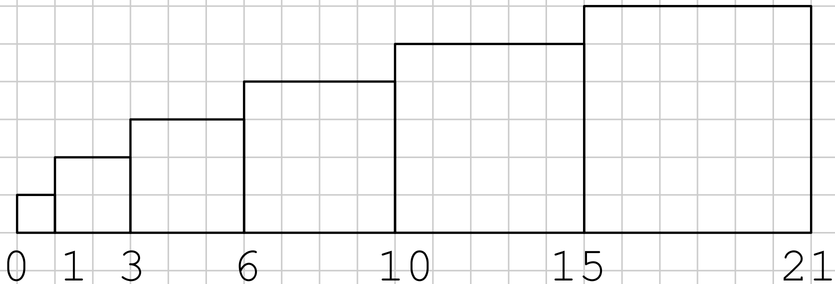
$1^2+2^2+3^2+...+n^2 = Sn$

dimostrazione

dimostrazione

Provo con la formula del politrapezio.

Vicolo cieco.



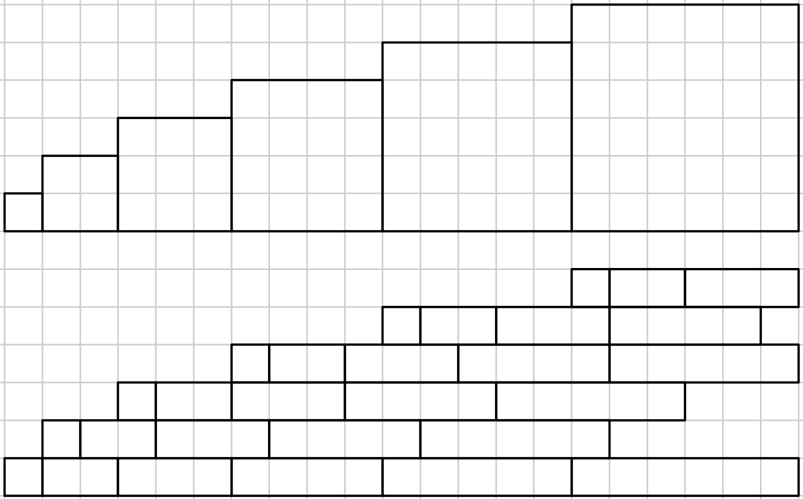
0 1 1 3 3 6 6 10 10 15 15 21

1 1 2 2 3 3 4 4 5 5 6 6

dimostrazione

Provo ad approssimare con un’altra figura.

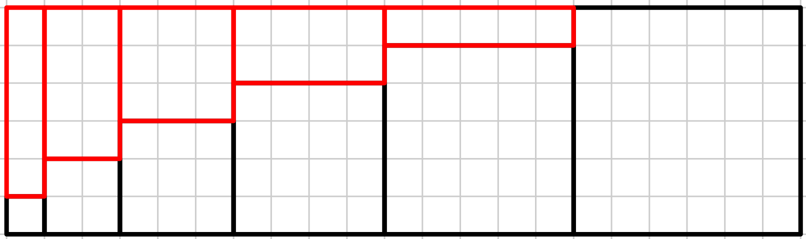
Vicolo cieco.

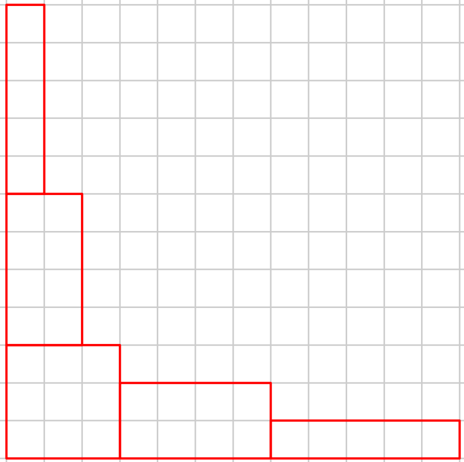


Studio la figura

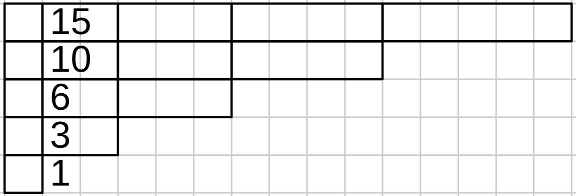
1)la completo a un qualcosa di misurabile

2)forse la figura complementare e' piu' facilmente misurabile





n	Tn
5	35
4	20
3	10
2	4
1	1



$$Tn=(1^2+1+2^2+2+3^2+3+...+n^2+n)/2$$

$$= (1^2+2^2+3^2+...+n^2)/2$$

$$+ (1+2+3+...+n)/2$$

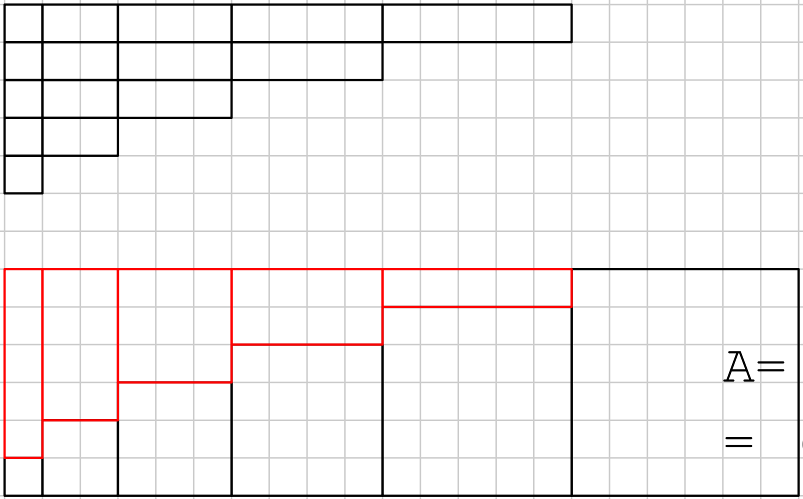
$$= Sn/2 + (n^2+n)/4$$

$$T(n-1)= (Sn-n^2)/2 +((n-1)^2+n-1)/4$$

$$= Sn/2 -n^2/2 +(n^2+1-2n+n-1)/4$$

$$= Sn/2 -n^2/4 -n/4$$

$$= Sn/2 -(n^2+n)/4$$



$A = base * altezza$

$= ((n^2+n)/2)*n$

$$A_n = S_n + T(n-1)$$

$$((n^2+n)/2)*n = S_n + S_n/2 - n^2/4 - n/4$$

$$(3/2)S_n = ((n^2+n)/2)*n + n^2/4 + n/4$$

$$(3/2)S_n = (1/2)(n^3+n^2+n^2/2+n/2)$$

$$S_n = n^3/3 + n^2/2 + n/6$$