Hw 3

$$\sum_{k=1}^{n=1} 2k-1 = n^2$$

$n=2$

$(4-1)+1=4,\ n^2=4$

so true n

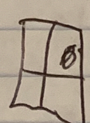
now prove

$n = n+1$

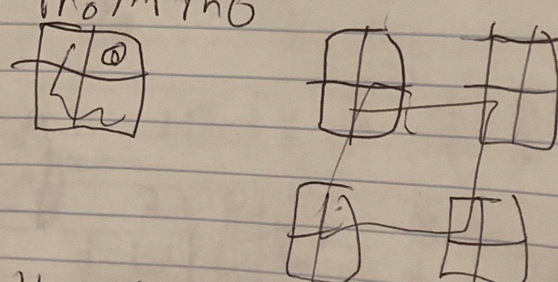
$$\sum_{k=1}^{n+1} 2k-1 = (n+1)^2$$

$$\sum_{k=1}^{n} 2k-1 + \cancel{2n+1} = n^2 + \cancel{2n+1}$$

so true by induction

Q  $= n = 1$

tromino



$n = n = 2$

follow pursuit

(C) $n=1, 1$

$4-1+1=4$

$5+3+1=9$

$7+5+3+1=16$

$9+7+5+3+1=25$ so true

(3) $\sum_{k=1}^{n} k = \frac{n(n+1)}{2}$

$n=2$

$2+1 = \frac{2(3)}{2}$

So true.

$\sum^{n}$ so prove for $n+1$

$\sum_{k=n}^{n+1} k = \frac{(n+1)(n+1+1)}{2}$

$\sum_{k=n}^{n} k + n+1 = \frac{n^2+3n+2}{2}$

$(n+1)n$

$\frac{(n^2+n)}{2} + \frac{2(n+1)}{2}$

$\sum_{n=k}^{n} k$

by Induction true

(4) $S = \frac{n(n+1)}{2}$ / $S = \frac{100(100+1)}{2} = 5050$

$S = n(2a+(n-1)d)/2$

$a=1, d=1, n=100$

Therefore

$100(2(1)+100-1(1))/2 = 5050$

(c) 1+
2+1
3+2+1
4+3+2+1

(3) $\sum_{k=1}^{n} k$, $\sum_{k=1}^{n} k = \left(\frac{n(n+1)}{2}\right)^2$

(a) $\sum_{n=1}^{n+1} k^2 = \left(\frac{n(n+1)}{2}\right)^2$

$\sum_{k=1}^{n} k^2 + (n+1)^2 = \left(\frac{(n+1)(n+2)}{2}\right)^2$

$\left(\frac{2(n+1)}{2} + \frac{n(n+1)}{2}\right)^2$

$\frac{n(n+1)}{2} + \frac{n(n+1)^2}{2}$

so true

~~44~~
1+4
1+4+9
1+4+9+16 so true

(4) $\sum_{k=}^{n} k^3 = \left(\frac{n(n+1)}{2}\right)^2$

$n = 2$

$8 =$