Bring — calculator

* tablet w/pen — plug in

pencil & paper

QR textbook

└ Using & Understanding Mathematics

Assignment ZERO — hello videos

PA#0 — exponents

PA#1 — Summation Notation

You must

Show Work

to receive

any credit

Assignment: super detailed work

OK in future

$\frac{a^6}{a^3} = a^3$ ~~$= a^3$~~

$= a^{6-3} = a^{6+(-3)} = a^3$

$(a^3)^2 = a^6 = a^{(3)(2)} = a^{3 \cdot 2} = a^6$

Summation Notation

$$\sum_{i=3}^{6} i^2 = i^2 + i^2 + i^2 + i^2 + i^2$$

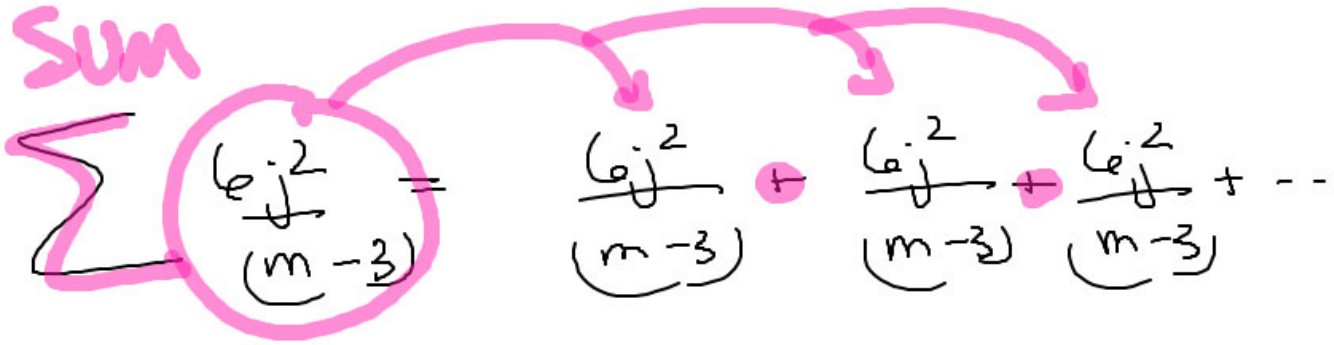
$$\sum_{k=0}^{4} k! = k! + k! + k! + k!$$

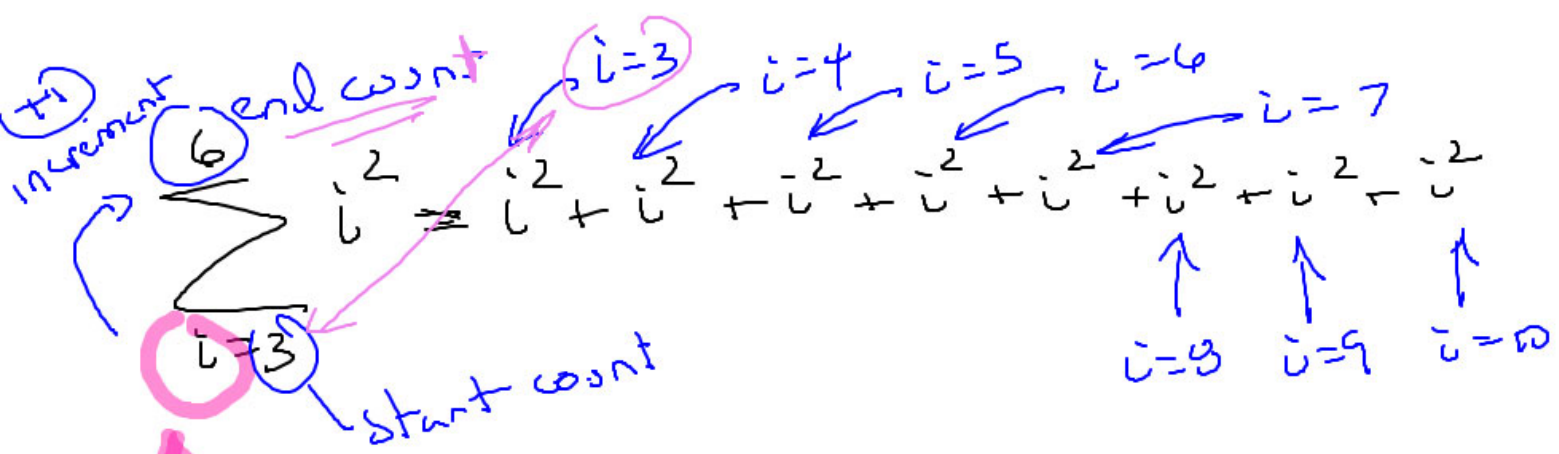
Σ ← "sum"

Sum whatever is to the right of Σ

Capital Greek letter S

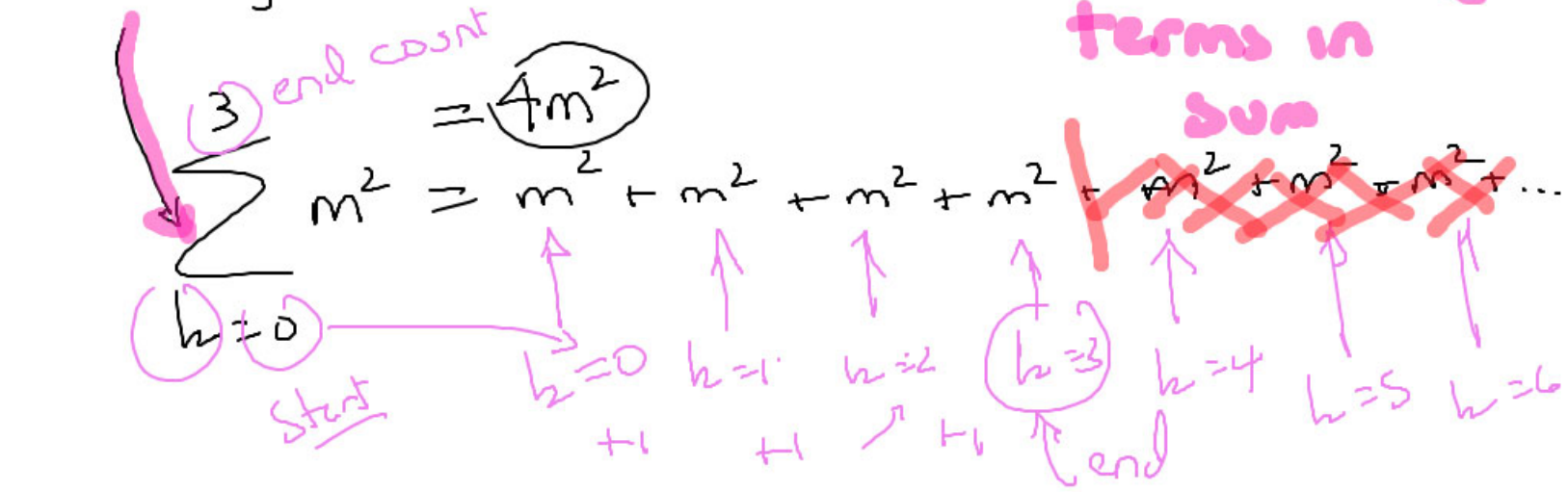
$$\sum \square = \square + \square + \square + \cdots$$

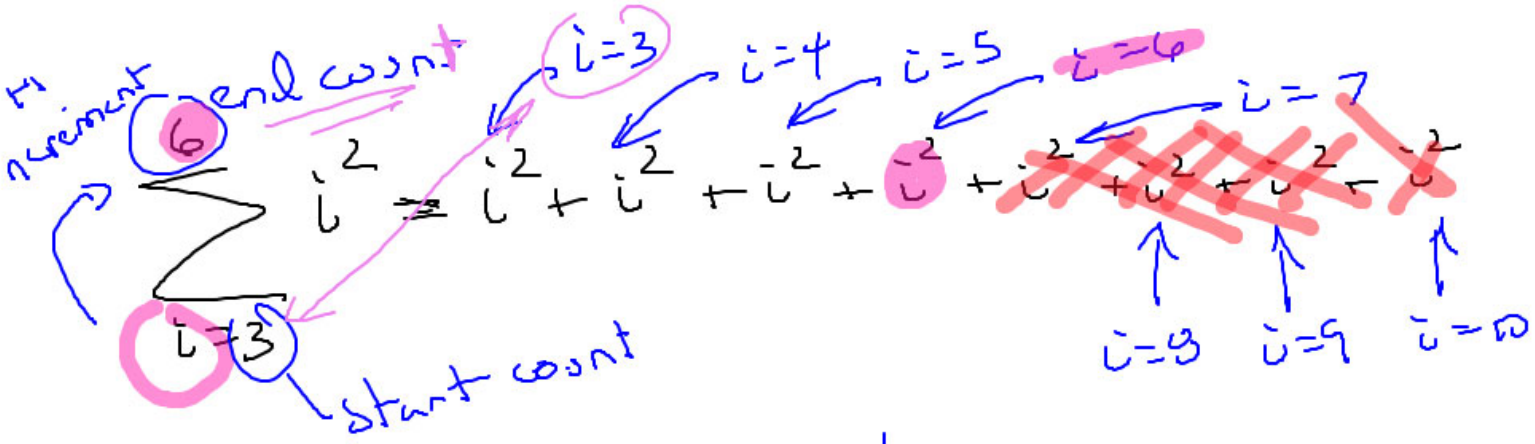

SUM
$\sum \frac{\sigma_j^2}{(m-3)} = \frac{\sigma_j^2}{(m-3)} + \frac{\sigma_j^2}{(m-3)} + \frac{\sigma_j^2}{(m-3)} + \cdots$



*Summation: part of each term

Index of Summation — *COUNTER — how many terms in sum





$$= \overset{3}{i}^2 + \overset{4}{i}^2 + \overset{5}{i}^2 + \overset{6}{i}^2 = 3^2 + 4^2 + 5^2 + 6^2$$

$i=3$ $\quad i=4$ $\quad i=5$ $\quad i=6$

$$= 9 + 16 + 25 + 36$$

$$= \underline{\underline{86}}$$

$$\sum_{i=3}^{6} i^2 = 86$$

$$\sum_{k=1}^{3} \frac{3k!}{(5-k)^2} = \frac{3k!}{(5-k)^2} + \frac{3k!}{(5-k)^2} + \frac{3k!}{(5-k)^2}$$

$k=1$

$k=1 \quad k=2 \quad k=3$

✓ counter

evaluate terms using

$$= \frac{3(1)!}{(5-1)^2} + \frac{3(2!)}{(5-2)^2} + \frac{3(3!)}{(5-3)^2}$$

1, $2=2(1)$, $6=3(2)1$

$$= \frac{3(1)}{16} + \frac{3(2)}{9} + \frac{3(6)}{4} = \frac{3}{16} + \frac{6}{9} + \frac{18}{4}$$

$$= \frac{3(1)}{16} + \frac{3(2)}{9} + \frac{3(6)}{4} = \frac{3}{16} + \frac{6}{9} + \frac{18}{4}$$

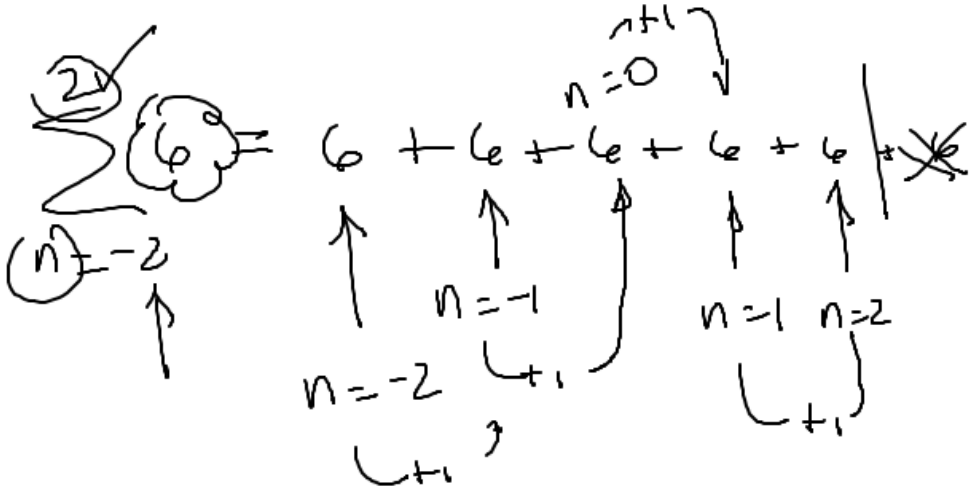
$(16 \times 9 = 144 \quad 144/4 = 36)$

$$= \frac{3}{16}\left(\frac{9}{9}\right) + \frac{6}{9}\left(\frac{16}{16}\right) + \frac{18}{4}\left(\frac{36}{36}\right)$$

$$= \frac{27}{144} + \frac{96}{144} + \frac{648}{144} = \frac{771}{144} = \frac{257}{48}$$

better

$$\approx 5.35416 \checkmark$$



$$= 6 + 6 + 6 + 6 + 6 = 30$$

$$\sum_{n=-2}^{2} 6 = 30$$

step value of h

$$\sum_{h=-2}^{1} \frac{h^2}{(h-3)} = \frac{h^2}{h-2} + \frac{h^2}{h-3} + \frac{h^2}{h-3} + \frac{h^2}{h-3}$$

$h = -2$ $\quad h = -1$ $\quad h = 0$ $\quad h = 1$

$+1$ $\quad +1$

index of summation is always an integer

✓ h – counter

✓ use h to evaluate each term

$$= \frac{(-2)^2}{(-2-3)} + \frac{(-1)^2}{(-1-3)} + \frac{0^2}{(0-3)} + \frac{1^2}{(1-3)}$$

$$= \frac{(-2)^2}{(-2-3)} + \frac{(-1)^2}{(-1-3)} + \frac{0^2}{(0-3)} + \frac{1^2}{(1-3)}$$

$$= \frac{4}{-5} + \frac{1}{-4} + \frac{0}{-3} + \frac{1}{-2}$$

$$= -\frac{4}{5} - \frac{1}{4} + 0 - \frac{1}{2}$$

$$= \frac{-16}{20} - \frac{5}{20} + 0 - \frac{10}{20} = \frac{-31}{20}$$

$$\sum_{m=-2}^{2} \frac{|m|^2}{(3-m)^2} =$$

$$\sum_{j=1}^{3} \frac{6^2}{m} = \frac{6^2}{m} + \frac{6^2}{m} + \frac{6^2}{m} = 3\left(\frac{6^2}{m}\right) = \frac{3(36)}{3}$$

$$= \frac{108}{3}$$

$$= 36$$

index of summation

$j=1$ $\quad$ $j=2$ $\quad$ $j=3$

$+1$ $\quad$ $+1$

$$\sum_{m=-2}^{2} \frac{|m|^2}{(3-m)^2} = \underbrace{\frac{|m|^2}{(3-m)^2}}_{m=-2} + \underbrace{\frac{|m|^2}{(3-m)^2}}_{m=-1} + \underbrace{\frac{|m|^2}{(3-m)^2}}_{m=0} + \underbrace{\frac{|m|^2}{(3-m)^2}}_{m=1} + \underbrace{\frac{|m|^2}{(3-m)^2}}_{m=2}$$

$$= \frac{|-2|^2}{[3-(-2)]^2} + \frac{|-1|^2}{[3-(-1)]^2} + \frac{|0|^2}{(3-0)^2} + \frac{|1|^2}{(3-1)^2} + \frac{|2|^2}{(3-2)^2}$$

$$= \frac{4}{25} + \frac{1}{16} + 0 + \frac{1}{4} + \frac{4}{1} =$$

$$= \frac{32}{400} + \frac{25}{400} + 0 + \frac{100}{400} + \frac{1600}{400} = \frac{1789}{400}$$