$\wedge$

(05)

$\boxed{2, 3, 4, 9, 16, 29, 54, 99 \dots}$

S. Fibonacci

(06) $\boxed{1, 2, 9, 121, (130)^2 \dots}$

16900

(07)

$$0, 10, 24, 42, 64, 90, \dots$$

$$10 \quad 14 \quad 18 \quad 22 \quad 26$$

$$2A = 4 \quad 4 \quad 4 \quad 4 \quad 4$$

$C = 0$

$A + B = 6$

$A = 2 \qquad AN^2 + BN + C$

$B = 4 \qquad 2N^2 + 4N - 6$

$\qquad\qquad 2N \qquad -2$

$C = -6 \qquad N \qquad 3$

$$(2N - 2)(N + 3)$$

$$2(N - 1)(N + 3)$$

SBS
Toshare

∧

$\sqrt{40} = ?$

$D = -3$ $4 \; ; \; 9 \; ; \; 18 \; ; \; 37 \; ; \; 72 \; ; \ldots$

$A+B+C = 7$ $5 \quad 9 \quad 19 \quad 35$

$6A+2B = -2$ $4 \quad 10 \quad 16$

$6A = 6$ $6 \quad 6$

(A=1) (B=-4) (C=10) (D=-3)

$(AN^3 + BN^2 + C N + D)$

$1(40)^3 - 4(40)^2 + 10(40) - 3$

57997

09 *) $\dfrac{1}{2} \; ; \; \dfrac{4}{3} \; ; \; \dfrac{9}{4} \; ; \; \dfrac{16}{5} \; \cdots \dfrac{N^2}{N+1}$ *) $\dfrac{1}{2} \; ; \; \dfrac{2}{3} \; ; \; \dfrac{3}{4} \; ; \; \dfrac{4}{5} \; ; \cdots \Rightarrow \dfrac{N}{N+1}$

$1° \quad 2° \quad 3° \quad 4°$

$\dfrac{N^2}{N+1} - \dfrac{N}{N+1}$

$\dfrac{N(N-1)}{N+1}$

$$\boxed{Series}$$

$1+2+3+4+\cdots+\widehat{N}$

$$\frac{N(N+1)}{2}$$

$1^2+2^2+3^2\ldots+\widehat{N^2}$

$$\frac{N(N+1)(2N+1)}{6}$$

$1^3+2^3+3^3+\ldots+\widehat{N^3}$

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

$2+4+6+8+\ldots+\widehat{40}$

$N(N+1) \qquad \frac{40}{2}\Rightarrow\widehat{20}$

$20(21)$

$\widehat{420}$

$1+3+5+7+\ldots+\widehat{19}$

$\boxed{N^2} \qquad \frac{19+1}{2}\to\widehat{10}$

$(10)^2$

100

$2^2+4^2+6^2\ldots\longrightarrow$

$1^2+3^2+5^2+\ldots$

$$\frac{N(N+1)(N+2)}{6}$$

$1^2+3^2+5^2\ldots+\widehat{17^2}$

$$\frac{17(18)(19)}{6}$$

$$\frac{1}{7} + \frac{1}{7^2} + \frac{1}{7^3} + \frac{1}{7^4} + \cdots = \boxed{\frac{1}{6}}$$

$$\frac{1}{4} + \frac{1}{4^2} + \frac{1}{4^3} + \frac{1}{4^4} + \cdots = \boxed{\frac{1}{3}}$$

$$\frac{1}{2} + \frac{1}{2^2} + \frac{1}{2^3} + \frac{1}{2^4} + \cdots = \boxed{\frac{1}{1}}$$

$$\frac{1}{10} + \frac{1}{10^2} + \frac{1}{10^3} + \frac{1}{10^4} + \cdots = \boxed{\frac{1}{9}}$$

$$\frac{2}{5} + \frac{1}{5^2} + \frac{2}{5^3} + \frac{1}{5^4} + \frac{2}{5^5} + \cdots$$

$$\frac{21_{(5)}}{44_{(5)}}$$

$$\frac{2(5)+1}{4(5)+4}$$

$$\frac{11}{24}$$

10 . 24 . 42 . 64 . 90 . ...

14 . 18 . 22 . 26

$A = 4$ 4   4   4   4

$A=2$ $An^2 + Bn + C$

$B=4$ $\boxed{2N^2 + 4N - 6}$

2N   -2

$C = -6$ N   3

$(2N-2)(N+3)$

$2(N-1)(N+3)$ ✓

$\boxed{(2+N)}$

(19)

(18) (2N+1) números

$N + (N+1) + (N+2) + (N+3) + \ldots + (3N) = 1640$

$\underline{N} + \underline{N+1} + \underline{N+2} + \underline{N+3} + \ldots \underline{N + (2N)} = 1640$

$(\underline{N + N + N + \ldots + N}) + \underline{1 + 2 + 3 + \ldots + 2N} = 1640$
$(2N+1)$ veces

$N(2N+1) + \dfrac{2N(2N+1)}{2} = 1640$

$2\,N(2N+1) = 1640$

$N(2N+1) = 820$

$\boxed{N = 20}$

(19) $\displaystyle\sum_{x=1}^{30} x + \sum_{x=1}^{27} x$

(20) $\displaystyle\sum_{i=1}^{17} i^2 + \sum_{x=1}^{24} x^2$

$1(21-1) + 2(21-2) + 3(21-3) + \ldots 20(21-20)$

$1\times21 - 1^2 + 2\times21 - 2^2 + 3\times21 - 3^2 + \ldots + 20\times21 - 20^2$

$21\left(1+2+3+\ldots+20\right) - \left(1^2 + 2^2 + 3^2 + \ldots + 20^2\right)$

$21\left(\dfrac{\overset{10}{\cancel{20}}(21)}{\cancel{2}}\right) - \dfrac{20(21)(41)}{6}$

$4410 - 2870$

$\boxed{1540}$

Left board (partial):

x^2

$+\cdots 20(21-20)$

$+\cdots+20\times21-20^2$

$+\cdots+20^2)$

Right board:

(14)

$$\frac{1}{1\times2}+\frac{1}{2\times3}+\frac{1}{3\times4}+\cdots+\frac{1}{16\times17}$$
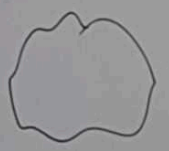
$$\frac{1}{1}\left(\frac{1}{1}\times\frac{1}{17}\right)$$

$$\boxed{\frac{16}{17}}$$

(15)

$\quad 1° \qquad 2° \qquad 3° \qquad 29°$

$$\frac{1}{2\cdot4}+\frac{1}{3\cdot8}+\frac{1}{4\times12}+\cdots+\frac{1}{30\times124}$$

$$\frac{1}{2\cdot4}+\frac{1}{4\times6}+\frac{1}{6\times8}+\cdots+\frac{1}{58\times60}$$

$$\frac{1}{2}\left(\frac{1}{2}-\frac{1}{60}\right)$$

(16)

$$\frac{1}{6\times9}+\frac{1}{9\times12}+\frac{1}{12\times15}+\cdots+\frac{1}{30\times33}$$

$$\frac{1}{3}\left(\frac{1}{6}-\frac{1}{33}\right)$$

$$\frac{1}{3}\left(\frac{7}{22}\right)\rightarrow\boxed{\frac{1}{22}}$$

SUMA F_{20}

(17)

$1\longrightarrow F_1$

$2\ 3\longrightarrow F_2$

$4\ 5\ 6\longrightarrow F_3$

$7\ 8\ 9\ 10\longrightarrow F_4$

$11\ 12\ 13\ 14\ 15\longrightarrow F_5$

$\rightarrow F_{20}$

$S_{F_1}\ S_{F_2}\ S_{F_3}\ S_{F_4}\ S_{F_5}\ \ldots S_{F_{20}}$

$D:\ 0 \quad 1 \quad 5 \quad 15 \quad 34 \quad 65$

$\quad\quad\quad 4 \quad 10 \quad 19 \quad 31$

$\quad\quad\quad\quad 6 \quad 9 \quad 12$

$\quad\quad\quad\quad\quad 3 \quad 3$

$A+B+C=1$

$6A+2B=3$

$6A=3$

An^3+Bn^2+Cn+D

$\frac{1}{2}(20)^3+\frac{1}{2}(20)$

4010

$6A=3 \qquad 6A+2B=3 \qquad A+B+C=1$

$A=\frac{3}{6}=\frac{1}{2} \quad 6\left(\frac{1}{2}\right)+2B=3 \quad \frac{1}{2}+0+C=1$

$\boxed{A=\frac{1}{2}} \qquad \boxed{B=0} \qquad \boxed{C=\frac{1}{2}}$

(18) $(2N+1)$ números

$N + (N+1) + (N+2) + (N+3) + \ldots + (3N) = 1640$

$\underline{N} + \underline{N+1} + \underline{N+2} + \underline{N+3} + \ldots + \underline{N+2N} = 1640$

$\underbrace{N+N+N+\ldots+N}_{(2N+1)\ veces} + \underbrace{1+2+3+\ldots+2N}_{} = 1640$

$N(2N+1) + \dfrac{2N(2N+1)}{2} = 1640$

$\cancel{2}N(2N+1) = 1640$

$N(2N+1) = 820$

$\boxed{N=20}$

(19) $\displaystyle\sum_{x=1}^{30} x + \sum_{x=1}^{27} x$

$\underbrace{1+2+3+\ldots+30}_{} \;\Big|\; \underbrace{1+2+\ldots+27}_{}$

(20) $\displaystyle\sum_{i=1}^{17} i^2 + \sum_{x=1}^{24} x^2$

$\underbrace{1^2+2^2+\ldots+17^2}_{} \;\Big|\; \underbrace{1^2+2^2+\ldots+24^2}_{}$

$\dfrac{20(21-20)}{}$

$\underline{1\times21-1^2} + \underline{2\times21-2^2} + \underline{3\times21-3^2} + \ldots + \underline{20\times21-20^2}$

$21\Big(1+2+3+\ldots+20\Big) - \Big(1^2+2^2+3^2+\ldots+20^2\Big)$

$21\left(\dfrac{\overset{10}{\cancel{20}}(21)}{\cancel{2}}\right) - \dfrac{20(21)(41)}{6}$

$4410 - 2870$

$\boxed{1540}$

Prof. Ademar
0939010134