

1- Hallar los cinco primeros términos de las siguientes sucesiones

a) $a_n = 5n$

$a_1 = 5(1)$

$a_1 = 5$

$a_2 = 5(2)$

$a_2 = 10$

$a_3 = 5(3)$

$a_3 = 15$

$a_4 = 5(4)$

$a_4 = 20$

$a_5 = 5(5)$

$a_5 = 25$

Términos =

$a_n = 5n \{5, 10, 15, 20, 25, \dots\}$

c) $a_n = 2^2 + n^3$

$a_1 = 4 + 1^3$

$a_1 = 4 + 1$

$a_1 = 5$

$a_2 = 2^2 + 2^3$

$a_2 = 4 + 8$

$a_2 = 12$

$a_3 = 2^2 + 3^3$

$a_3 = 4 + 27$

$a_3 = 31$

$a_4 = 2^2 + 4^3$

$a_4 = 4 + 64$

$a_4 = 68$

$a_5 = 2^2 + 5^3$

$a_5 = 4 + 125$

$a_5 = 129$

Términos

$\{5, 12, 31, 68, 129, \dots\}$

b) $a_n = (-1)^2 (2n) = \text{Términos}$ d) $a_n = \frac{3n}{1+2n}$

$a_1 = 1 \cdot 2 = 2$

$a_1 = 2 \checkmark$

$a_2 = (-1)^2 (2(2))$

$a_2 = 1 \cdot 4$

$a_2 = 4 \checkmark$

$a_3 = (-1)^2 (2(3))$

$a_3 = 1 \cdot 6$

$a_3 = 6 \checkmark$

$a_4 = (-1)^2 (2(4))$

$a_4 = 1 \cdot 8$ $a_4 = 8 \checkmark$

$a_5 = (-1)^2 (2(5))$

$a_5 = 1 \cdot 10 = 10$

$a_5 = 10 \checkmark$

$\{2, 4, 6, 8, 10, \dots\}$

$a_1 = \frac{3(1)}{1+2(1)}$

$a_1 = \frac{3}{1+2}$

$a_1 = \frac{3}{3} = \frac{1}{1} = 1 \checkmark$

$a_2 = \frac{3(2)}{1+2(2)}$

$a_2 = \frac{6}{1+4} = \frac{6}{5} \checkmark$

$a_2 = \frac{6}{5}$

$a_3 = \frac{3(3)}{1+2(3)}$

$a_3 = \frac{9}{1+6} = \frac{9}{7}$

$a_3 = \frac{9}{7} \checkmark$

$a_4 = \frac{3(4)}{1+2(4)}$

$a_4 = \frac{12}{1+8} = \frac{12}{9}$

$a_4 = \frac{12^4}{8^3} = \frac{4}{3}$

$a_4 = \frac{4}{3} \checkmark$

$a_5 = \frac{3(5)}{1+2(5)}$

$a_5 = \frac{15}{1+10}$

$a_5 = \frac{15}{11} \checkmark$

Términos

$\{1, \frac{6}{5}, \frac{9}{7}, \frac{4}{3}, \frac{15}{11}, \dots\}$

$$e) -(-1)^n (5n - 3)$$

$$-(-1)^1 (5(1) - 3)$$

$$a_1 = -(-1)(5 - 3)$$

$$a_1 = 1 \cdot 2$$

$$a_1 = 2 \checkmark$$

$$a_2 = -(-1)^2 (5(2) - 3)$$

$$a_2 = -(1)(10 - 3)$$

$$a_2 = -1 \cdot 7$$

$$a_2 = -7 \checkmark$$

$$a_3 = -(-1)^3 (5(3) - 3)$$

$$a_3 = -(-1)(15 - 3)$$

$$a_3 = 1 \cdot 12$$

$$a_3 = 12 \checkmark$$

$$a_4 = -(-1)^4 (5(4) - 3)$$

$$a_4 = -(1)(20 - 3)$$

$$a_4 = -1 \cdot 17$$

$$a_4 = -17 \checkmark$$

$$a_5 = -(-1)^5 (5(5) - 3)$$

$$a_5 = -(-1)(25 - 3)$$

$$a_5 = 1 \cdot 22$$

$$a_5 = 22 \checkmark$$

Terminos.

$$\{2, -7, 12, -17, 22, \dots\}$$

$$F) n^n + n^2 + 2n + 1$$

$$a_1 = 1^1 + 1^2 + 2(1) + 1$$

$$a_1 = 1 + 1 + 2 + 1$$

$$a_1 = 5 \checkmark$$

$$a_2 = 2^2 + 2^2 + 2(2) + 1$$

$$a_2 = 4 + 4 + 4 + 1$$

$$a_2 = 13 \checkmark$$

$$F) a_3 = 3^3 + 3^2 + 2(3) + 1$$

$$a_3 = 27 + 9 + 6 + 1$$

$$a_3 = 43 \checkmark$$

$$a_4 = 4^4 + 4^2 + 2(4) + 1$$

$$a_4 = 256 + 16 + 8 + 1$$

$$a_4 = 281 \checkmark$$

$$a_5 = 5^5 + 5^2 + 2(5) + 1$$

$$a_5 = 3125 + 25 + 10 + 1$$

$$a_5 = 3161 \checkmark$$

Terminos

$$\{5, 13, 43, 281, 3161, \dots\}$$

$$g) a_n = 4 + (-4)^n$$

$$a_1 = 4 + (-4)^1 \quad a_5 = -1020 \checkmark$$

$$a_1 = 4 + (-4)$$

Terminos

$$a_1 = 4 - 4$$

$$a_1 = 0 \checkmark$$

$$\{0, 20, -60, 260, -1020, \dots\}$$

$$a_2 = 4 + (-4)^2$$

$$a_2 = 4 + (16)$$

$$a_2 = 4 + 16$$

$$a_2 = 20 \checkmark$$

$$a_3 = 4 + (-4)^3$$

$$a_3 = 4 + (-64)$$

$$a_3 = 4 - 64$$

$$a_3 = -60 \checkmark$$

$$a_4 = 4 + (-4)^4$$

$$a_4 = 4 + (256)$$

$$a_4 = 4 + 256$$

$$a_4 = 260 \checkmark$$

$$a_5 = 4 + (-4)^5$$

$$a_5 = 4 + (-1024)$$

$$a_5 = 4 - 1024$$

$$h) a_n = 7 + \frac{1}{3n}$$

$$a_5 = \frac{170+1}{15}$$

$$a_1 = \frac{7(3)^1 + 1}{3(1)}$$

$$a_5 = \frac{1702}{15}$$

$$a_1 = \frac{7(3)^1 + 1}{3(1)}$$

terminos:

$$\left\{ \frac{22}{3}, \frac{32}{3}, \frac{190}{9}, \frac{142}{3}, \frac{1702}{15}, \dots \right\}$$

$$a_1 = \frac{21+1}{3} = \frac{22}{3}$$

$$a_2 = \frac{7(3)^2 + 1}{3(2)}$$

$$a_2 = \frac{7(9) + 1}{6}$$

$$a_2 = \frac{63+1}{6} = \frac{64}{6} = \frac{32}{3}$$

$$a_3 = \frac{7(3)^3 + 1}{3(3)}$$

$$a_3 = \frac{7(27) + 1}{9}$$

$$a_3 = \frac{189+1}{9} = \frac{190}{9}$$

$$a_3 = \frac{190}{9}$$

$$a_4 = \frac{7(3)^4 + 1}{3(4)}$$

$$a_4 = \frac{7(81) + 1}{12}$$

$$a_4 = \frac{567+1}{12} = \frac{568}{12} = \frac{142}{3}$$

$$a_5 = \frac{7(3)^5 + 1}{3(5)}$$

$$a_5 = \frac{7(243) + 1}{15}$$

opción 2. pto h

$$b) a_n = 7 + \frac{1}{3^n}$$

$$a_4 = \frac{567+1}{81} = \frac{568}{81}$$

$$a_n = \frac{7(3)^n + 1}{3^n}$$

$$a_4 = \frac{568}{81} = 7,01 \checkmark$$

$$a_1 = \frac{7(3)^1 + 1}{3^1}$$

$$a_5 = \frac{7(3)^5 + 1}{3^5}$$

$$a_1 = \frac{7(3) + 1}{3}$$

$$a_5 = \frac{7(243) + 1}{243}$$

$$a_1 = \frac{21+1}{3} = \frac{22}{3} = 7,3 \checkmark$$

$$a_5 = \frac{1701+1}{243} =$$

$$a_2 = \frac{7(3)^2 + 1}{3^2}$$

$$a_5 = \frac{1702}{243} = 7 \checkmark$$

$$a_2 = \frac{7(9) + 1}{9}$$

Términos

{ 7,3, 7,1, 7,03, 7,01, 7, ... }

$$a_2 = \frac{63+1}{9} = \frac{64}{9}$$

$$a_2 = \frac{64}{9} = 7,1 \checkmark$$

$$a_3 = \frac{7(3)^3 + 1}{3^3}$$

$$a_3 = \frac{7(27) + 1}{27}$$

$$a_3 = \frac{189+1}{27} = \frac{190}{27}$$

$$a_3 = \frac{190}{27} = 7,03 \checkmark$$

$$a_4 = \frac{7(3)^4 + 1}{3^4}$$

$$a_4 = \frac{7(81) + 1}{81} \uparrow$$

2) Observa la Figura 1 que expresión determina la cantidad de azulejos en la Figura n?

Figura 1



Figura 2

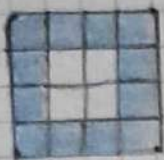
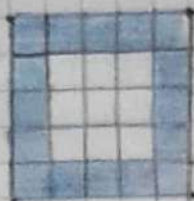


Figura 3



8

12

16

$\{a_1, a_2, a_3, \dots, a_n\}$
 $\{8, 12, 16, \dots, n\}$

$$a_n = 8 + 4(n-1) \checkmark$$

4 4 $\rightarrow d = 4$

la expresión es

$$a_n = 8 + 4(n-1)$$

$$a_1 + d = (n-1)$$

$$a_1 = 8 + 4(1-1)$$

$$a_1 = 8 + 4(0)$$

$$a_1 = 8 + 0$$

$$a_1 = 8 \checkmark$$

$$a_2 = 8 + 4(2-1)$$

$$a_2 = 8 + 4(1)$$

$$a_2 = 8 + 4$$

$$a_2 = 12 \checkmark$$

$$a_3 = 8 + 4(3-1)$$

$$a_3 = 8 + 4(2)$$

$$a_3 = 8 + 8$$

$$a_3 = 16 \checkmark$$

③ encuentra el término indicado en cada sucesión

a) a_n , si $a_1 = 3$ y $a_n = -2 + a_{n-1}$

$$a_1 = 3$$

$$d = 2$$

$$a_2 = 5$$

$$a_3 = 7$$

$$a_4 = 9$$

b) b_6 si $b_1 = 0,25$ y $b_n = 4b_{n-1}$

$$b_1 = 0,25$$

$$r = 4$$

$$b_2 = 0,25 \cdot 4 = 1$$

$$b_3 = 1 \cdot 4 = 4$$

$$b_4 = 4 \cdot 4 = 16$$

$$b_5 = 16 \cdot 4$$

$$b_5 = 64$$

$$b_6 = 64 \cdot 4 = 256$$

entonces $b_6 = 256$

$$c) \text{ si } c_1 = 2 \text{ y } c_n = c_{n-1}$$

$$c_1 = 2$$

$$c_2 = 2$$

$$c_3 = 2$$

$$c_4 = 2$$

$$d) \text{ si } a_1 = 0, a_2 = 1 \text{ y } a_n = 2a_{n-1} + a_{n-2}$$

$$a_3 = 2 \cdot 1 + 0 = 2$$

$$a_1 = 0$$

$$a_2 = 1$$

$$a_4 = 2 \cdot 2 + 1 = 5$$

$$a_3 = 2$$

$$a_5 = 2 \cdot 5 + 2 = 12$$

4) Deduce la fórmula del término general de cada sucesión

a) $\{7, 14, 21, 28, \dots\}$ Fórmula término general

$$a_n = 7n$$

$$a_n = 7 \cdot n$$

$$a_1 = 7(1)$$

$$a_1 = 7$$

$$a_2 = 7(2)$$

$$a_2 = 14$$

$$a_3 = 7(3)$$

$$a_3 = 21$$

$$a_4 = 7(4)$$

$$a_4 = 28$$

b) $\{4, 5, 6, 7, 8, \dots\}$

$$a_n = n + 3$$

Fórmula término general

$$a_1 = 1 + 3$$

$$a_n = n + 3$$

$$a_1 = 4 \checkmark$$

$$a_2 = 2 + 3$$

$$a_2 = 5 \checkmark$$

$$a_3 = 3 + 3$$

$$a_3 = 6 \checkmark$$

$$a_4 = 4 + 3$$

$$a_4 = 7 \checkmark$$

$$a_5 = 4 + 4$$

$$a_5 = 8 \checkmark$$

$$c) \left\{ \overset{a_1}{\frac{2}{2}}, \overset{a_2}{\frac{4}{3}}, \overset{a_3}{\frac{6}{3}}, \overset{a_4}{\frac{8}{3}} \dots \right\}$$

$$\left. \begin{array}{l} 2 \\ 4 \\ 6 \\ 8 \end{array} \right\} 2n \quad \left. \begin{array}{l} 2 \\ 3 \\ 3 \\ 3 \\ \dots \\ 11 \end{array} \right\} d=3$$

$$z(1) = 2$$

$$z(2) = 4$$

$$z(3) = 6$$

$$z(4) = 8$$

Formula término geral * ↓

$$a_1 + d(n-1) \quad * \quad a_n = \frac{2n}{2+3(n-1)}$$

$$a_1 = 2 + 3(n-1)$$

$$a_1 = 2 + 3(1-1)$$

$$a_1 = 2 + 3(0)$$

$$a_1 = 2 + 0 = 2$$

$$a_1 = 2$$

$$a_4 = 2 + 3(4-1)$$

$$a_4 = 2 + 3(3)$$

$$a_4 = 2 + 9$$

$$a_4 = 11$$

entonces ↓ =

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

$$a_2 = 2 + 3(2-1)$$

$$a_2 = 2 + 3(1)$$

$$a_2 = 2 + 3$$

$$a_2 = 5$$

$$a_1 = \frac{2(1)}{2+3(1-1)}$$

$$a_1 = \frac{2}{2+3(0)}$$

$$a_1 = \frac{2+0}{2}$$

$$a_1 = \frac{2}{2} \checkmark$$

$$a_3 = 2 + 3(3-1)$$

$$a_3 = 2 + 3(2)$$

$$a_3 = 2 + 6$$

$$a_3 = 8$$

$$a_2 = \frac{2(2)}{2+3(2-1)}$$

$$a_2 = \frac{4}{2+3(1)}$$

$$a_2 = \frac{4}{2+3}$$

$$a_2 = \frac{4}{5} \checkmark$$

$$a_3 = \frac{2(3)}{2+3(3-1)}$$

$$a_3 = \frac{6}{2+3(2)}$$

$$a_3 = \frac{6}{2+6}$$

$$a_3 = \frac{6}{8} \checkmark$$

$$a_4 = \frac{2(4)}{2+3(4-1)}$$

$$a_4 = \frac{8}{2+3(3)}$$

$$a_4 = \frac{8}{2+9}$$

$$a_4 = \frac{8}{11} \checkmark$$

$$d) \{3, 6, 12, 24, 48, \dots\} \quad a_n = a_1 \cdot r^{n-1} \quad [n \geq 1]$$

$$a_n = 3 \cdot 2^{n-1} \rightarrow \text{Formula término general}$$

$$a_1 = 3 \cdot 2^{1-1} = 0$$

$$a_1 = 3 \cdot 2^0 = 1$$

$$a_1 = 3 \cdot 1 =$$

$$a_1 = 3 \checkmark$$

$$a_2 = 3 \cdot 2^{2-1} = 3$$

$$a_2 = 3 \cdot 2^1$$

$$a_2 = 3 \cdot 2$$

$$a_2 = 6 \checkmark$$

$$a_3 = 3 \cdot 2^{3-1} = 6$$

$$a_3 = 3 \cdot 2^2$$

$$a_3 = 3 \cdot 4$$

$$a_3 = 12 \checkmark$$

$$a_4 = 3 \cdot 2^{4-1} = 12$$

$$a_4 = 3 \cdot 2^3$$

$$a_4 = 3 \cdot 8$$

$$a_4 = 24$$

$$a_5 = 3 \cdot 2^{5-1} = 24$$

$$a_5 = 3 \cdot 2^4$$

$$a_5 = 3 \cdot 16$$

$$a_5 = 48 \checkmark$$

$$b) \{ 3, 8, 15, 24, 35, \dots \}$$

$$a_n = (n+1)^2 - 1$$

Formula término n º

$$a_1 = (1+1)^2 - 1$$

$$a_n = (n+1)^2 - 1$$

$$a_1 = 2^2 - 1$$

$$a_1 = 4 - 1$$

$$a_1 = 3 \checkmark$$

$$a_2 = (2+1)^2 - 1$$

$$a_2 = (3)^2 - 1$$

$$a_2 = 9 - 1$$

$$a_2 = 8 \checkmark$$

$$a_3 = (3+1)^2 - 1$$

$$a_3 = (4)^2 - 1$$

$$a_3 = 16 - 1$$

$$a_3 = 15 \checkmark$$

$$a_4 = (4+1)^2 - 1$$

$$a_4 = (5)^2 - 1$$

$$a_4 = 25 - 1$$

$$a_4 = 24 \checkmark$$

$$a_5 = (5+1)^2 - 1$$

$$a_5 = (6)^2 - 1$$

$$a_5 = 36 - 1$$

$$a_5 = 35 \checkmark$$

$$c) \left\{ \frac{1}{2}, \frac{4}{5}, \frac{9}{8}, \frac{16}{11}, \dots \right\}$$

$$a_n = \frac{n^2}{3n-1} = \text{término general}$$

$$a_1 = \frac{1^2}{3(1)-1}$$

$$a_1 = \frac{1}{3-1}$$

$$a_1 = \frac{1}{2} \checkmark$$

$$a_2 = \frac{2^2}{3(2)-1}$$

$$a_2 = \frac{4}{6-1}$$

$$a_2 = \frac{4}{5} \checkmark$$

$$a_3 = \frac{3^2}{3(3)-1}$$

$$a_3 = \frac{9}{9-1}$$

$$a_3 = \frac{9}{8} \checkmark$$

$$a_4 = \frac{4^2}{3(4)-1}$$

$$a_4 = \frac{16}{12-1}$$

$$a_4 = \frac{16}{11}$$

7) Determinar cuánto dinero, recibirán 4 hermanos, si el mayor, recibirá \$40 000 más, y además el dinero que se distribuye es \$2000.000

$$X + 40\,000(n-m)$$

$$a_1 + d(n-m)$$

$$X + 40\,000(n-m) + X + 40\,000(n-m) + X + 40\,000(n-m) + X + 40\,000(n-m) = 2\,000\,000$$

$$X + 40\,000(1-4) + X + 40\,000(2-4) + X + 40\,000(3-4) + X + 40\,000(4-4) = 2\,000\,000$$

$$= X + 40\,000(3) + X + 40\,000(-2) + X + 40\,000(-1) + X + 40\,000(0) = 2\,000\,000$$

$$X - 120\,000 + X - 80\,000 + X - 40\,000 + X(0) = 2\,000\,000$$

$$4X - 240\,000 = 2\,000\,000$$

$$4X = 2\,240\,000$$

$$X = \frac{2\,240\,000}{4} = 560\,000$$

$$X_1 = 560\,000 \text{ hermano mayor}$$

$$X_2 = 560\,000 - 40\,000 = 520\,000 \text{ hermano 2}$$

$$X_3 = 520\,000 - 40\,000 = 480\,000 \text{ hermano 3}$$

$$X_4 = 480\,000 - 40\,000 = 440\,000 \text{ hermano 4}$$

pag 46 pto 7

a) un árbol crece cada año 20%, si al comenzar el año su altura era de 0,75 m ¿cuál es la altura que alcanzará el árbol al cabo de 10 años?

$$0,75 \text{ m} + 20\%$$

$$0,75 \cdot 20 \div 100 = 0,15$$

$$0,75 \text{ m} + 0,15 = 0,90 \text{ mts al año}$$

$$a_0 = 0,75 \text{ m} + 0,15$$

$$a_1 = 0,75 \text{ m} + 0,15$$

$$a_1 = 0,90 \text{ m}$$

$$a_2 = 0,90 + 0,15$$

$$a_2 = 1,05 \text{ mts}$$

$$a_3 = 1,05 + 0,15$$

$$a_3 = 1,20 \text{ mts}$$

$$a_4 = 1,20 \text{ mts} + 0,15$$

$$a_4 = 1,35 \text{ mts}$$

$$a_5 = 1,35 \text{ mts} + 0,15$$

$$a_5 = 1,50 \text{ mts}$$

así sucesivamente

$$a_6 = 1,50 \text{ m} + 0,15$$

$$a_6 = 1,65 \text{ mts}$$

$$a_7 = 1,65 \text{ mts} + 0,15$$

$$a_7 = 1,80 \text{ mts}$$

$$a_8 = 1,80 \text{ mts} + 0,15$$

$$a_8 = 1,95 \text{ mts}$$

$$a_9 = 1,95 \text{ mts} + 0,15$$

$$a_9 = 2,10 \text{ mts}$$

$$a_{10} = 2,10 \text{ mts} + 0,15$$

$$a_{10} = 2,25 \text{ mts}$$

al cabo de 10 años

la altura que alcanzará es de 2,25 mts.

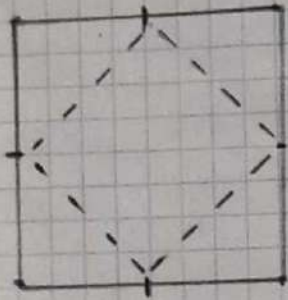
$$a_{10} = 2,25 \text{ mts.}$$

donde $a_n = a_1 + 0,15(n-1)$
entonces

$$a_{10} = 0,75 + 0,15(10-1)$$

y así sucesivamente.

b) los puntos medios de los lados de un cuadrado con perimetro 24 cm, son los vertices de un segundo cuadrado, y los puntos medios de los lados del segundo cuadrado son los vertices de un tercer cuadrado y así sucesivamente, hasta el decimo cuadrado. Hallar el area del decimo cuadrado.



$$P = 24 \text{ cmts.}$$

$$4L = \frac{24}{4} = 6$$

$$L = 6 \text{ cmts}$$

$$A = L \cdot L$$

$$A = 6 \cdot 6 = 36 \text{ cmts}^2$$

$$a_1 = 36$$

$$a_n \cdot r^{n-1}$$

$$a_2 = 36 \left(\frac{1}{2}\right)^{2-1}$$

$$a_2 = 36 \left(\frac{1}{2}\right)^1$$

$$a_2 = \frac{36}{2} = 18$$

$$a_3 = 36 \left(\frac{1}{2}\right)^{3-1}$$

$$a_3 = 36 \left(\frac{1}{2}\right)^2$$

$$a_3 = \frac{36}{4} = 9$$

$$a_4 = 36 \left(\frac{1}{2}\right)^{4-1}$$

$$a_4 = 36 \left(\frac{1}{2}\right)^3$$

$$a_4 = \frac{36}{8} = 4.5$$

$$a_5 = 36 \left(\frac{1}{2}\right)^{5-1}$$

$$a_5 = 36 \left(\frac{1}{2}\right)^4$$

$$a_5 = \frac{36}{16} = 2.25$$

$$a_5 = 2.25$$

$$a_6 = 36 \left(\frac{1}{2}\right)^{6-1}$$

$$a_6 = 36 \left(\frac{1}{2}\right)^5$$

$$a_6 = \frac{36}{32} = 1.125$$

$$a_7 = 36 \left(\frac{1}{2}\right)^{7-1}$$

$$a_7 = 36 \left(\frac{1}{2}\right)^6$$

$$a_7 = \frac{36}{64} = 0.5625$$

$$a_8 = 36 \left(\frac{1}{2}\right)^{8-1}$$

$$a_8 = 36 \left(\frac{1}{2}\right)^7$$

$$a_8 = \frac{36}{128} = 0,28125$$

$$a_9 = 36 \left(\frac{1}{2}\right)^{9-1}$$

$$a_9 = 36 \left(\frac{1}{2}\right)^8$$

$$a_9 = \frac{36}{256} = 0,140625$$

$$a_{10} = 36 \left(\frac{1}{2}\right)^{10-1}$$

$$a_{10} = 36 \left(\frac{1}{2}\right)^9$$

$$a_{10} = \frac{36}{512} = 0,0703125$$

Área del décimo cuadrado

$$a_{10} = 0,0703125 \text{ cm}^2$$