

1 Hallar los cinco primeros términos de las siguientes sucesiones.

a  $a_n = 5_n$

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

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

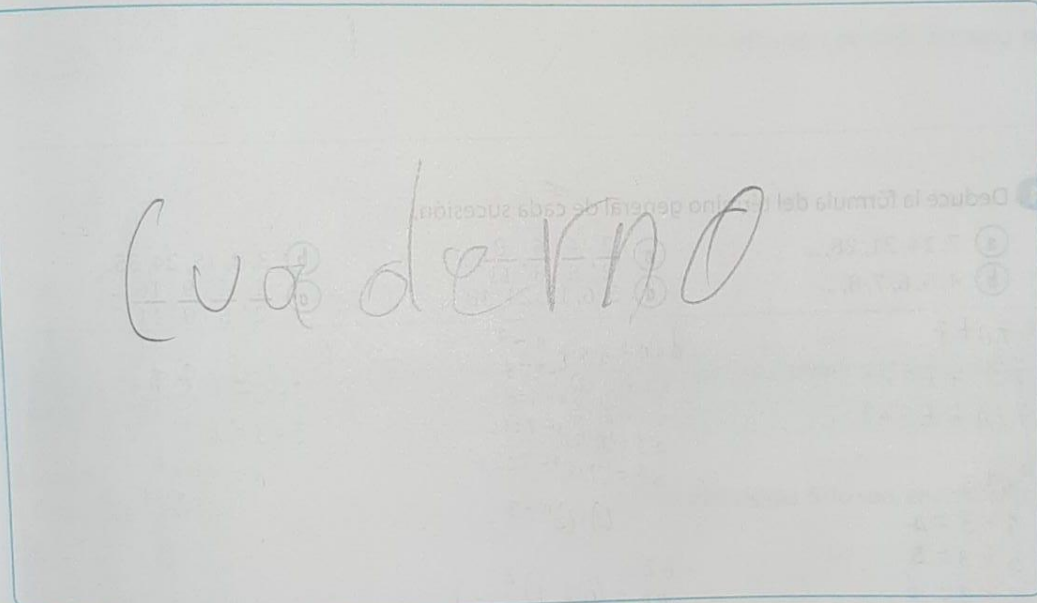
d  $a_n = \frac{3n}{1+2n}$

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

f  $a_n = n^n + n^2 + 2n + 1$

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

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



2 Observa la figura. ¿Qué expresión determina la cantidad de azulejos en la figura n?

Figura 1



$8 + 4 = 12 + 4 = 16$

Figura 2



Figura 3



$4n + 4$   
 $4 \cdot 1 + 4 = 8$   
 $4 \cdot 2 + 4 = 12$   
 $4 \cdot 3 + 4 = 16$   
 $4 \cdot 4 + 4 = 20$

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A  $a_n = 5 \cdot n$

$$a_1 = \frac{5 \times 1}{5}$$

$$a_3 = \frac{5 \times 3}{15}$$

$$a_5 = \frac{5 \times 5}{25}$$

$$a_2 = \frac{5 \times 2}{10}$$

$$a_4 = \frac{5 \times 4}{20}$$

$$a_n = (5, 10, 15, 20, 25)$$

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

$$a_1 = (-1)^2 (2 \times 1)$$

$$2 = a_1$$

$$a_n = (2, 4, 6, 8, 10)$$

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

$$4 = a_2$$

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

$$6 = a_3$$

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

$$8 = a_4$$

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

$$10 = a_5$$

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

$$a_1 = 2^2 + 1^3$$

$$a_1 = 4 + 1 = 5 = a_1$$

$$a_2 = 2^2 + 2^3$$

$$a_2 = 4 + 8 = 12 = a_2$$

$$a_3 = 2^2 + 3^3$$

$$a_3 = 4 + 27 = 31 = a_3$$

$$a_4 = 2^2 + 4^3$$

$$a_4 = 4 + 64 = 68 = a_4$$

$$a_5 = 2^2 + 5^3$$

$$a_5 = 4 + 125 = 129 = a_5$$

d

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

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

$$a_2 = \frac{3 \times 2}{1 + 2 \cdot 2} = \frac{6}{5} = \frac{6}{5} = a_2$$

$$a_3 = \frac{3 \times 3}{1 + 2 \times 3} = \frac{9}{1+6} = \frac{9}{7} = \frac{9}{7} = a_3$$

$$a_4 = \frac{3 \times 4}{1 + 2 \times 4} = \frac{12}{1+8} = \frac{12}{9} = \frac{4}{3} = a_4$$

simplifica en 3

$$a_5 = \frac{3 \times 5}{1 + 2 \times 5} = \frac{15}{1+10} = \frac{15}{11} = a_5$$

$$e \quad a_n = -(-1)^n (5n - 3)$$

$$a_1 = -(-1)^1 (5 \times 1 - 3)$$

$$-(-1) \cdot 2$$

$$1 \cdot 2 = 2 = a_1$$

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

$$-1 \cdot 7 = -7 = a_2$$

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

$$-(-1) (15 - 3)$$

$$1 \times 12 = 12 = a_3$$

$$a_4 = -(-1)^4 (5 \times 4 - 3)$$
$$= -1 (20 - 3)$$
$$= -1 \cdot 17 = -17 = a_4$$

$$a_5 = -(-1)^5 (5 \times 5 - 3)$$
$$= -(-1) (25 - 3)$$
$$= 1 \cdot 22 = 22 = a_5$$

$$F$$
$$a_n = n^n + n^2 + 2n + 1$$

$$a_1 = 1^1 + 1^2 + 2 \times 1 + 1$$
$$= 1 + 1 + 2 + 1 = 5 = a_1$$

$$a_2 = 2^2 + 2^2 + 2 \times 2 + 1$$
$$= 4 + 4 + 4 + 1 = 13 = a_2$$

$$a_3 = 3^3 + 3^2 + 2 \times 3 + 1$$
$$= 27 + 9 + 6 + 1 = 43 = a_3$$

$$a_4 = 4^4 + 4^2 + 2 \times 4 + 1$$
$$= 256 + 16 + 8 + 1 = 281 = a_4$$

$$a_5 = 5^5 + 5^2 + 2 \times 5 + 1$$

$$3125 + 25 + 10 + 1 = 3161 = a_5$$

$$\textcircled{6} \quad a_n = 4 + (-4)^n$$

$$a_1 = 4 + (-4)^1$$
  
$$4 - 4 = 0 = a_1$$

$$a_2 = 4 + (-4)^2$$
  
$$4 + 16 = 20 = a_2$$

$$a_3 = 4 + (-4)^3$$
  
$$4 - 64 = -60 = a_3$$

$$a_4 = 4 + (-4)^4$$
  
$$4 + 256 = 260 = a_4$$

$$a_5 = 4 + (-4)^5$$
  
$$4 - 1024 = -1020 = a_5$$

$$\text{H } a_n = 7 + \frac{1}{3 \cdot n}$$

$$a_1 = 7 + \frac{1}{3 \cdot 1}$$

$$\frac{7}{1} + \frac{1}{3}$$

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

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

$$\frac{7}{1} + \frac{1}{9}$$

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

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

$$\frac{7}{1} + \frac{1}{27}$$

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

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

$$\frac{7}{1} + \frac{1}{81}$$

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

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

$$\frac{7}{1} + \frac{1}{243}$$

$$\frac{1701}{243} + \frac{1}{243} = \frac{1702}{243} = a_5$$



3 Encuentra el término indicado en cada sucesión.

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

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

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

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

a)  $a_1 = 3$   
 $a_2 = 5$   
 $a_3 = 7$   
 $a_4 = 9$

c)  $c_1 = 2$   
 $c_2 = 2$   
 $c_3 = 2$   
 $c_4 = 2$

b)  $b_1 = 0,25$   
 $b_2 = 0,25 \cdot 4 = 1$   
 $b_3 = 1 \cdot 4 = 4$   
 $b_4 = 4 \cdot 4 = 16$   
 $b_5 = 16 \cdot 4 = 64$   
 $b_6 = 64 \cdot 4 = 256$

d)  $a_1 = 0$   
 $a_2 = 1$   
 $a_3 = 2 \cdot 1 + 0 = 2$   
 $a_4 = 2 \cdot 2 + 1 = 5$   
 $a_5 = 2 \cdot 5 + 2 = 12$

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4 Deduce la fórmula del término general de cada sucesión.

a) 7, 14, 21, 28, ...

b) 4, 5, 6, 7, 8, ...

c)  $\frac{2}{2}, \frac{4}{5}, \frac{6}{8}, \frac{8}{11}, \dots$

d) 3, 6, 12, 24, 48, ...

b) 3, 8, 15, 24, 35, ...

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

a)  $7n + 7$   
 $7(1) + 7 = 14$   
 $7(2) + 7 = 21$

b)  $n + 3$   
 $1 + 3 = 4$   
 $2 + 3 = 5$   
 $3 + 3 = 6$   
 $4 + 3 = 7$

c)  $n + 6$   
 No estoy seguro

d)  $a_n = a_1 \cdot r^{n-1}$   
 $a_1 = (3)(2)^{1-1} = 3$   
 $a_2 = (3)(2)^{2-1} = 6$   
 $a_3 = (3)(2)^{3-1} = 12$   
 $a_4 = (3)(2)^{4-1} = 24$   
 $(3) \cdot (2)^{n-1}$

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

$a_1 = (1+1)^2 - 1 = 2^2 - 1 = 4 - 1 = 3$

$a_2 = (2+1)^2 - 1 = 3^2 - 1 = 9 - 1 = 8$

c)  $c + c = c$   
 $3 + 3 = 6$   
 No estoy seguro

- 7 Determina cuánto dinero reciben cuatro hermanos, si cada uno, después del mayor, recibirá \$40.000 menos, y además el dinero que se distribuye es de \$2.000.000.

$$2.000.000 \div 4 = 500.000$$

$$240.000 \div 4 = 60.000$$

$$2.000.000 - 240.000 = 1.760.000$$

$$H_1 = 560.000$$

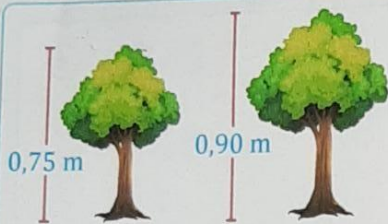
$$H_3 = 480.000$$

$$H_2 = 520.000$$

$$H_4 = 440.000$$

- 7 Lee el enunciado, luego responde.

- a) Un árbol crece cada año un 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?



$$a_n = a_1 \cdot r^{(n-1)}$$

$$n = 10$$

$$a_n = 0,75 \cdot (1,2)^{(10-1)}$$

$$a_n = 0,75 \cdot (1,2)^9$$

$$a_n = 3,87 \text{ m}$$

- b) Los puntos medios de los lados de un cuadrado con perímetro de 24 cm son los vértices de un segundo cuadrado, y los puntos medios de los lados del segundo cuadrado son los vértices de un tercer cuadrado y así sucesivamente, hasta el décimo cuadrado. Halla el área del décimo cuadrado.

$$24 \frac{4}{4}$$

$$\frac{6}{\sqrt{2}} = 4,24$$

$$\frac{2,11}{\sqrt{2}} = 1,492$$

$$\frac{0,745}{\sqrt{2}} = 0,526$$

$$\frac{4,24}{\sqrt{2}} = 2,99$$

$$\frac{1,492}{\sqrt{2}} = 1,055$$

$$\frac{0,526}{\sqrt{2}} = 0,371$$

$$\frac{2,99}{\sqrt{2}} = 2,11$$

$$\frac{1,055}{\sqrt{2}} = 0,745$$

$$\frac{0,371}{\sqrt{2}} = 0,262$$

$$\frac{2,11}{\sqrt{2}} = 1,492$$

$$\frac{0,745}{\sqrt{2}} = 0,526$$

$$\frac{0,262}{\sqrt{2}} = 0,185$$

$$\frac{1,492}{\sqrt{2}} = 1,055$$

$$\frac{0,526}{\sqrt{2}} = 0,371$$

$$\frac{0,185}{\sqrt{2}} = 0,131$$

$$\frac{1,055}{\sqrt{2}} = 0,745$$

$$\frac{0,371}{\sqrt{2}} = 0,262$$

$$\frac{0,131}{\sqrt{2}} = 0,093$$

$$0,262 \times 4 = 1,048$$