

EXAMEN DE MATEMÁTICAS. 3º ESO. SUCESSIONES.

1. a) $5, 2, -1, -4, -7, -10, -13, -16, \dots$

b) $5, 3, 4, 3, 5, 3, 625, 3, 6875, 3, 65625$
 $+2 \quad +1 \quad -0,5 \quad +0,25 \quad -0,125 \quad +0,0625 \quad -0,03125$

c) $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}, \dots$

d) $10, -5, 2, 5, -1, 25, 0, 625, -0, 3125, 0, 15625, -0, 078125$

2. $a_3 = 1, a_7 = 9 \quad a_n = ?$

$a_3 \quad a_4 \quad a_5 \quad a_6 \quad a_7 \quad a_7 = a_3 + 4d \Rightarrow 9 = 1 + 4d \Rightarrow$

$\Rightarrow 9 - 1 = 4d \Rightarrow d = \frac{8}{4} \Rightarrow \boxed{d = 2} \Rightarrow a_n = 3 + (n-1) \cdot 2 \Rightarrow$

$\Rightarrow a_n = 3 + 2n - 2 \Rightarrow \boxed{a_n = 2n - 1}$

3. $a_n = 2 \cdot \left(\frac{1}{2}\right)^{n-1}$

$a_1 = 2 \cdot \left(\frac{1}{2}\right)^0 \Rightarrow a_1 = 2$

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

$a_3 = 2 \cdot \left(\frac{1}{2}\right)^2 \Rightarrow a_3 = 2 \cdot \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

$a_4 = 2 \cdot \left(\frac{1}{2}\right)^3 \Rightarrow a_4 = 2 \cdot \frac{1}{8} = \frac{2}{8} = \frac{1}{4}$

4. $a_1 = 5, r = 3 \quad P.G.$

a) $a_n = a_1 \cdot r^{n-1} \Rightarrow \boxed{a_n = 5 \cdot 3^{n-1}}$

b) $a_{12} = a_1 \cdot r^{11} \Rightarrow a_{12} = 5 \cdot 3^{11} = 885735$

c) $S_{12} = \frac{a_{12} \cdot r - a_1}{r - 1} = \frac{885735 \cdot 3 - 5}{3 - 1} = 1328600$

5.

$$a_1 = 10$$

$$a_2 = 12$$

$$\underline{\underline{a_3 = 14}}$$

(P.A.)

$$d = 2; \quad 5.000 : 25 = 200 \text{ largos}$$

$$a_n = a_1 + (n-1)d \Rightarrow 200 = 10 + (n-1) \cdot 2 \Rightarrow 200 = 10 + 2n - 2$$

$$\Rightarrow 200 - 10 + 2 = 2n \Rightarrow 192 = 2n \Rightarrow n = \frac{192}{2} = 96$$

SOL: Debe entrenar 96 días.

$$6. \quad S_{30} = \frac{(a_1 + a_{30}) \cdot 30}{2}$$

$$a_{30} = a_1 + 29 \cdot 2 \Rightarrow a_{30} = 10 + 29 \cdot 2 = 68 \Rightarrow S_{30} = \frac{(10 + 68) \cdot 30}{2} = 1.170 \text{ largos}$$

$$1.170 \times 25 = 29.250 \Rightarrow 29.250 \text{ m} = 29,25 \text{ km}$$

SOL: Habrá hecho 29,25 km

$$7. \quad 1^{\text{er}} \text{ día} \Rightarrow a_1 = 200$$

$$2^{\text{o}} \text{ día} \Rightarrow a_2 = 200 \times 2$$

$$3^{\text{er}} \text{ día} \Rightarrow a_3 = 200 \times 2^2$$

$$4^{\text{o}} \text{ día} \Rightarrow a_4 = 200 \times 2^3$$

$$\underline{\underline{15 \text{ días} \Rightarrow a_{15} = 200 \times 2^{14} = 3.276.800}}$$

SOL: Habrá 3.276.800 bacterias