



1 Determina cuáles de las siguientes sucesiones son aritméticas. Si la sucesión es aritmética, encuentra la diferencia y el término  $n$ -ésimo para cada sucesión.

~~a~~ 2, 7, 12, 17, 22, 27, ...

~~b~~ 10, 4, -2, -8, -14, ...

c  $\frac{5}{2}, \frac{11}{6}, \frac{7}{6}, \frac{1}{2}, -\frac{1}{6}, \dots$

d  $e^{-1}, e^{-2}, e^{-3}, e^{-4}, e^{-5}, \dots$

e  $\frac{13}{6}, \frac{17}{12}, \frac{2}{3}, \dots$

A  $a_n = (n-1)5$

B  $a_n = (n-1) - 6$

Determina el dato que se indica en cada caso, suponiendo que (a) es una progresión aritmética.

a  $a_1 = 1, a_n = 16, a = ?$

b  $a_1 = \frac{1}{2}, a_n = \frac{1}{8}, a = ?$

c  $a_1 = 1, a_n = 10, a = ?$

d  $a_1 = 1, a_n = 180, a = ?$

e  $a_1 = 1, a_n = 1, a = ?$

2 Identifica cuáles sucesiones son aritméticas. Luego escribe los cinco primeros términos de aquellas que lo sean.

a  $a_n = 4 - n$

~~b~~  $\{a_n = -n + 8\}$

e  $a_n = \frac{1}{2 + \pi}$

~~c~~  $\{a_n = \frac{2}{n+2}\}$

~~d~~  $a_n = n + \frac{\pi}{2}$

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

a  $n=4-1=3$   
 $n=4-2=2$   
 $n=4-3=1$   
 $n=4-4=0$   
 $n=4-5=-1$

b  $n=-1+8=7$   
 $n=-2+8=6$   
 $n=-3+8=5$   
 $n=-4+8=4$   
 $n=-5+8=3$

c  $n=\frac{2}{1+2}=\frac{2}{3}$   
 $n=\frac{2}{2+2}=\frac{1}{2}$   
 $n=\frac{2}{3+2}=\frac{2}{5}$   
 $n=\frac{2}{4+2}=\frac{1}{3}$   
 $n=\frac{2}{5+2}=\frac{2}{7}$

d  $n=\frac{2}{1+2}=\frac{2}{3}$   
 $n=\frac{2}{2+2}=\frac{1}{2}$   
 $n=\frac{2}{3+2}=\frac{2}{5}$   
 $n=\frac{2}{4+2}=\frac{1}{3}$   
 $n=\frac{2}{5+2}=\frac{2}{7}$

e  $n=1+1,57=2,57$   
 $n=2+1,57=3,57$   
 $n=3+1,57=4,57$   
 $n=4+1,57=5,57$   
 $n=5+1,57=6,57$

f  $a = \{2, 3, 4, 5, 6\}$

2 Encuentra el valor de cada suma.

a  $\sum_{k=1}^6 \frac{1}{2k} = 1,21$     c  $\sum_{n=1}^8 (+1)^{n+1} n^2 = 204$     e  $\sum_{n=1}^9 \frac{3n-1}{n} = 23,8$     g  $\sum_{n=1}^{10} \left(\frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+1}}\right)^n = 1,62$   
 b  $\sum_{n=2}^{10} \frac{1}{n^2-1} = 0,59$     d  $\sum_{n=1}^5 3^n(n+1) = 3921$     f  $\sum_{n=1}^5 \left(\frac{2}{7}\right)^{n-1} = 0,64$     h  $\sum_{n=1}^7 \left(1 + \frac{2}{n}\right)^n = 29,6$

a  $\sum_{k=1}^6 \frac{1}{2k} = \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \frac{1}{8} + \frac{1}{10} + \frac{1}{12} = 1,21$   
 b  $\sum_{n=2}^{10} \frac{1}{n^2-1} = \frac{1}{2^2-1} + \frac{1}{3^2-1} + \frac{1}{4^2-1} + \frac{1}{5^2-1} + \frac{1}{6^2-1} + \frac{1}{7^2-1} + \frac{1}{8^2-1} + \frac{1}{9^2-1} + \frac{1}{10^2-1}$   
 $= \frac{1}{3} + \frac{1}{8} + \frac{1}{15} + \frac{1}{24} + \frac{1}{35} + \frac{1}{48} + \frac{1}{63} + \frac{1}{80} + \frac{1}{99} = 0,59$   
 c  $\sum_{n=1}^8 (+1)^{n+1} n^2 = (+1)^{1+1}(1)^2 + (+1)^{2+1}(2)^2 + (+1)^{3+1}(3)^2 + (+1)^{4+1}(4)^2 + (+1)^{5+1}(5)^2 + (+1)^{6+1}(6)^2 + (+1)^{7+1}(7)^2 + (+1)^{8+1}(8)^2$   
 $= 1 + 4 + 9 + 16 + 25 + 36 + 49 + 64 = 204$   
 d  $\sum_{n=1}^5 3^n(n+1) = 3^1(1+1) + 3^2(2+1) + 3^3(3+1) + 3^4(4+1) + 3^5(5+1)$   
 $= 6 + 27 + 108 + 540 + 3240 = 3921$   
 e  $\frac{3-1}{1} + \frac{6-1}{2} + \frac{9-1}{3} + \frac{12-1}{4} + \frac{15-1}{5} + \frac{18-1}{6} + \frac{21-1}{7} + \frac{24-1}{8} + \frac{27-1}{9} = 2$   
 $+ 2,5 + 2,6 + 2,7 + 2,8 + 2,8 + 2,8 + 2,8 + 2,8 = 23,8$

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$$\textcircled{D} 0,2 + 0,2 + 0,2 + 0,2 + 0,2 = 0,2 + 0,2 + 0,2 + 0,2 + 0,2 = 1,0$$
$$0,04 + 0,008 + 0,0016 = 0,0496$$

$$\textcircled{E} \frac{1}{1} - \frac{1}{2} + \frac{1}{1,4} - \frac{1}{2,4} + \frac{1}{1,7} + \frac{1}{2,2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{22} -$$

$$\frac{1}{3,2} + \frac{1}{2,4} + \frac{1}{3,4} + \frac{1}{2,6} - \frac{1}{3,6} + \frac{1}{2,8} - \frac{1}{3,8} + \frac{1}{3}$$

$$- \frac{1}{4} + \frac{1}{5} - \frac{1}{4,1} = 1,62$$

$$\textcircled{F} 3 + 2 + 1,6 + 1,5 + 1,4 + 1,3 + 1,2$$

$$3 + 4 + 4 + 5 + 5,3 + 4,8 + 3,5 = 29,6$$

3 Halla la suma de los diez primeros términos de cada sucesión.

a)  $a_n = 5^n - 5^{n-1} = 9.751,124$

c)  $a_n = n2^{n-1} = 9273$

e)  $a_n = 2n(2n-1)$

b)  $a_n = \frac{1}{n(n+1)(n+2)} = 1,82$

d)  $a_n = \left(\frac{1}{4}\right)^n + 3^{\frac{n}{5}} = 33,32$

f)  $a_n = n! \cdot (n-1)!$

$$\sum_{n=1}^{10} (5^n - 5^{n-1}) = 5^1 - (5)^{1-1} + 5^2 - (5)^{2-1} + 5^3 - (5)^{3-1} + 5^4 - (5)^{4-1} +$$

$$5^5 - (5)^{5-1} + 5^6 - (5)^{6-1} + 5^7 - (5)^{7-1} + 5^8 - (5)^{8-1} +$$

$$5^9 - (5)^{9-1} + 5^{10} - (5)^{10-1}$$

$$= 4 + 20 + 100 + 500 + 2500 + 12500 + 62500$$

$$+ 312500 + 1562500 + 7797500 = 9.751,124$$

Scribe

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$$\begin{aligned}
 \textcircled{b} \sum_{n=1}^{\infty} \frac{1}{n(n+1)(n+2)} &= \frac{1}{2(2+1)(2+2)} + \frac{1}{3(3+1)(3+2)} + \frac{1}{4(4+1)(4+2)} + \dots \\
 &= \frac{1}{2 \cdot 3 \cdot 4} + \frac{1}{3 \cdot 4 \cdot 5} + \frac{1}{4 \cdot 5 \cdot 6} + \dots \\
 &= \frac{1}{24} + \frac{1}{60} + \frac{1}{120} + \dots \\
 &= \frac{1}{9} + \frac{1}{24} + \frac{1}{60} + \frac{1}{120} + \frac{1}{210} + \frac{1}{336} + \frac{1}{504} + \dots
 \end{aligned}$$

$$\frac{1}{24} + \frac{1}{60} + \frac{1}{120} + \frac{1}{210} + \frac{1}{336} + \frac{1}{504} = 1,82$$

$$\begin{aligned}
 \textcircled{c} \sum_{n=1}^{10} n z^{n-1} &= 1(z)^{1-1} + 2(z)^{2-1} + 3(z)^{3-1} + 4(z)^{4-1} + \dots \\
 &= 1 + 2z + 3z^2 + 4z^3 + 5z^4 + 6z^5 + 7z^6 + 8z^7 + 9z^8 + 10z^9 \\
 &= 1 + 4 + 12 + 32 + 80 + 192 + 448 + 1024 + 2304 + 5120 = 9727
 \end{aligned}$$

$$d = \sum_{n=1}^{10} \left(\frac{1}{4}\right)^n + 3\frac{n}{5} = \left(\frac{1}{4}\right)^1 + 3\frac{1}{5} + \left(\frac{1}{4}\right)^2 + 3\frac{2}{5} +$$

$$\left(\frac{1}{4}\right)^3 + 3\frac{3}{5} + \left(\frac{1}{4}\right)^4 + 3\frac{4}{5} + \left(\frac{1}{4}\right)^5 + 3\frac{5}{5}$$

$$+ \left(\frac{1}{4}\right)^6 + 3\frac{6}{5} + \left(\frac{1}{4}\right)^7 + 3\frac{7}{5} + \left(\frac{1}{4}\right)^8 + 3\frac{8}{5}$$

$$+ \left(\frac{1}{4}\right)^9 + 3\frac{9}{5} + \left(\frac{1}{4}\right)^{10} + 3\frac{10}{5}$$

$$= 0,85 + 1,26 + 1,81 + 2,4 + 3$$

$$+ 3,6 + 4,2 + 4,8 + 5,4 + 6$$

$$= 33,32$$



