ARITMÉTICA — SEMANA # 07: NUMERACIÓN — DIVISIBI...

01| $M = \overline{4n6}_{(m)} + \overline{54}_{(m)} - \overline{3mn}_{(8)}$

(NUMERAL, BASE, "CIFRAS")

∴ CIFRA < BASE ⊜ BASE > CIFRA

∴ $5 < n < m$ → $5 < n < 7$ → $n = 6$

∴ $6 < m < 8$ → $m = 7$

∴ $n = 6$, $m = 7$

, M = ?

$M = 466_{(7)} + 54_{(6)} - 376_{(8)}$ (A BASE 10) (DESCOMPOSICIÓN POLINÓMICA)

∴ NO HAY BASE ESCRITA ⇒ ES BASE 10

$M = 4(7^2) + 6(7) + 6 + 5(6) + 4 - [3(8^2) + 7(8) + 6]$

$M = 244 + 34 - 254$

$M = 278 - 254$

$M = 24$

02| $\overline{abc}_{(5)} = 97_{(10)}$ (A BASE)

∴ DIVISIONES SUCECIVAS

97 ÷ 5 = 19, residuo (2)

19 ÷ 5 = (3), residuo (4)

$97_{(10)} = 342_{(5)}$

$\overline{abc}_{(5)} = 342_{(5)}$

$a = 3$

$b = 4$

$c = 2$

$a + b + c = 9$

03|

ERACIÓN — DIVISIBILIDAD

$\overline{abc}_{(5)} = 97_{(10)}$

A BASE

ONE SUCECIVAS

$97_{(10)} = 342_{(5)}$

$\overline{abc}_{(5)} = 342_{(5)}$

a = 3 +
b = 4
c = 2

a+b+c = 9

03| $\overline{abc}_{(5)} = 65_{(8)}$

∴ $65_{(8)}$ A BASE 10

$6(8)+5 = 53$

∴ 53 | 5 → 10 | 5 → residuos (3), (0), (2)

∴ $65_{(8)} = 203_{(5)}$

$\overline{abc}_{(5)} = 203_{(5)}$

a = 2 +
b = 0
c = 3

a+b+c = 5 R.

04| $\overline{2b4c}_{(n)} = 1131_{(6)}$

MAYOR # → MENOR BASE

MENOR # → MAYOR BASE

$4 < n < 6$

$n = 5$

$\overline{2b4c}_{(5)} = 1131_{(6)}$

∴ $1131_{(6)}$ A BASE 10

$1(6^3)+1(6^2)+3(6)+1 = 271$

∴ 271 | 5 → 54 | 5 → 10 | 5 → residuos (1), (4), (0), (2)

$\Rightarrow 271_{(10)} = 2041_{(5)}$

$\overline{2b4c}_{(n)} = 2041_{(5)}$

∴ b = 0
c = 1
n = 5

b+c+n = 6 R.

05| 155(...

1(x+1...

x^2+2x+...

05| $155_{(x+1)} = 203_{(x)}$

BASES CONSECUTIVAS: x, $x+1$.

$1(x+1)^2 + 5(x+1) + 5 = 2(x^2) + 0(x) + 3$

$x^2 + 2x + 1 + 5x + 5 + 5 = 2x^2 + 3$

$0 = x^2 - 7x - 8$

$x \longrightarrow -8 = 0$

$x \longrightarrow +1 = 0$

$x - 8 = 0$ / $x + 1 = 0$

$x = 8$ ✓ / $x = -1$ ✗

∴ Rpta: $203_{(8)}$

$2(8^2) + 0(8) + 3$

131 ✓

06| $\underbrace{(a-1)(a-1)(a-1)\ldots\ldots(a-1)}_{40 \text{ CIFRAS}}{}_{(a)} = 64^{20} - 1.$

$a^{40} - 1 = (64)^{20} - 1.$

$a^{40} = (8^2)^{20}$

$a^{40} = 8^{40}$

$a = 8$ ✓

∴ MÉTODO VIX:

$\underbrace{(n-1)(n-1)\ldots\ldots(n-1)}_{\text{"K" VECES}}{}_{(n)} = n^K - 1$

MACHA: GAY

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07

$$\begin{matrix}12\\ \;13\\ \;\;14\\ \;\;\;15\end{matrix} = \overline{ab}_{(6)}$$

Método Vix:

$2+3+4+15 = \overline{ab}_{(6)}$

$24_{(10)} = \overline{ab}_{(6)}$

$24 \,|\, 6$ → residuo (0), cociente (4)

$\overline{40}_{(6)} = \overline{ab}_{(6)}$

$a = 4$

$b = 0$

$a - b = 4$ D

08

$$\begin{matrix}13\\ \;13\\ \;\;13\\ \;\;\;13\\ \;\;\;\;b\end{matrix} = 18$$

$\therefore b = ?$

M.V:

$3+3+3+3+b = 18$

$12 + b = 18$

$b = 6$

D.

09 Σ cifr...

$3 + 4 + \ldots$

2...

2...

Nota

$\overset{\circ}{a} = a(k\ldots$

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$1\,3$
$1\,3$
$1\,3$
$1\,3$
b
$= 18$

$3+3+3+b = 18$

$12+b=18$

$b=6$

09 $\overline{3\,4\,a\,1\,a} = \overset{\circ}{3}$ (MÚLTIPLO; a: 0, …, 9)

$\sum$ CIFRAS DEL # ES $\overset{\circ}{3}$

$3+4+a+1+a = \overset{\circ}{3}$

$2a+8 = \overset{\circ}{3}$

$2(a)+8 = 3(k)$

a: 2, 5, 8 → k: 4, 6, 8

8 ← Rpta

Nota: $\overset{\circ}{a} = a(k)$

10 $\overline{7\,6\,5\,a} = \overset{\circ}{4} = 2^2$

LAS 2 ÚLTIMAS CIFRAS DEL # DEBE SER $\overset{\circ}{4}$

$\overline{5a} = \overset{\circ}{4}$

5 2 ← 4(13)
5 6 ← 4(14)

Rpta

11 $\overline{2\,a\,3\,a} = \overset{\circ}{7}$ (a: 0, …, 9)

DE DERECHA A IZQUIERDA SE COLOCAN "1, 3, 2" DE FORMA (+) y (−) : ALTERNADA

$\overline{2\,a\,3\,a} = \overset{\circ}{7}$
1 2 3 1
− +

$a+9+2a-2 = \overset{\circ}{7}$

$3a+7 = \overset{\circ}{7}$

$3(a)+7 = 7(k)$

a: 0, 7 → k: 1, 4

Rpta

12

12) $\overline{1a2a3a} = \overset{\circ}{9}$ (a: 0, ..., 9)

Σ CIFRAS DEL # ES $\overset{\circ}{9}$

$1+a+2+a+3+a = \overset{\circ}{9}$

$3a+6 = \overset{\circ}{9}$

$3(a)+6 = 9(k)$

a	k
1	1
4	2
7	3

Rpta: 7

13) $\overline{5a3a42} = \overset{\circ}{11}$

Signos: − + − + − +

DE DERECHA A IZQUIERDA ALTERNAR EL SIGNO (+) Y (−) = $\overset{\circ}{11}$

$2+a+a-4-3-5 = \overset{\circ}{11}$

$2a-10 = \overset{\circ}{11}$

$2(a)-10 = 11(k)$

$a = 5$, $k = 0$

Rpta: 5

14) $\overline{35a3a2} = \overset{\circ}{13}$

Signos: − + − + − +

Coeficientes: 4 2 1 4 3 1

DE DERECHA A IZQUIERDA LOS GRUPOS: (1,3,4) Y (1,2,4) DE FORMA ALTERNADA ASÍ COMO LOS SIGNOS (+) Y (−)

$\therefore 2-3a+12-a+10-12 = \overset{\circ}{13}$

$12-4a = \overset{\circ}{13}$

$12-4(a) = 13(k)$

$(3) = (0)$

$a = 3$

Rpta

14)

3	5	a	3	a	2
4	3	1	4	3	1
	+		−		+

$\equiv 13^{\circ}$

$\therefore 2-4a-12+15+12 \equiv 13^{\circ}$

$17-4(a) \equiv 13^{\circ}$

$17-4(a) = 13(k)$

$13 = 13$

$a = 1$

ARITMÉTICA

SEMANA # 07:

NUMERACIÓN

15) $\overline{4a32b} = 36^{\circ}$

EL # MENOR POSIBLE

$\therefore \overline{2b} = 4^{\circ}$

b=0 → 20 → 9(5)
Menor 24 → 4(6)
28 → 4(7)

$\therefore 4+a+3+2+b = 9^{\circ}$

$9+a+b = 9^{\circ}$

$9+a+0 = 9^{\circ}$

$a+9 = 9^{\circ}$

$(a)+9 = 9(k)$

Menor → 0	(1)
9	2

a=0

16) $N = 9x$

$N = (1+8)x\ (2x$

$N = (1+8)x\ (8^{1}x$

$N = (1+8^{1})8^{4}$

$N = 1(8^{4}) + 1$

$N = 1(8^{5}) + 1$

$N = 1\ 1$

$N = 1$

SEMANA # 07: NUMERACIÓN — DIVISIBILIDAD

16 $N = 9\times16^3 - 4\times16^2 + 20$ A BASE

$N = (1+8)\times(2\times8)^3 + 2(8)+4 - [4\times(2\times8)^2]$

$N = (1+8)\times(2\times8)^3 + 2(8)+4 - [4\times4\times8^2]$

$N = (1+8)\times(8^1\times8^3) + 2(8)+4 - [\underbrace{4\times4}_{16 = 2\times8^1}\times8^2]$

$N = (1+8)\,8^4 + 2(8)+4 - [2(8^3)]$

$N = 1(8^4) + 1(8^5) + 2(8)+4 - [2(8^3)]$

$N = 1(8^5) + 1(8^4) + 2(8)+4 - [2(8^3)]$

$N = 110024_{(8)} - 2000_{(8)}$

$N = 110024_{(8)} -$
$\quad 2000_{(8)}$

$106024_{(8)}$

$\sum$ CIFRAS $= 13$

11

$3(5^3) + 2(5^2) + 1(5) + 4$

$3214_{(5)}$

$4(6^4) + 3(6) + 1$

$40031_{(6)}$

ESTAKINES (1582)