Sistemas de Procesamiento de Datos

TP: Sistemas numéricos – Cambio de base – Reales son signo

Ejercicios resueltos

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TP: Sistemas numéricos – Cambio de base – Reales con signo

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1) Expresar en Ca2, mínima cant. de bits

a) $+31,6015625_d = 011111,1001101_b$

- $+31 = 011111_b$
- $0,6015625 \times 2 = 1,203125$
  $0,203125 \times 2 = 0,40625$
  $0,40625 \times 2 = 0,8125$
  $0,8125 \times 2 = 1,625$
  $0,625 \times 2 = 1,25$
  $0,25 \times 2 = 0,5$
  $0,5 \times 2 = 1,0$

b) $-610,94140625_d = 10.1100.111101,00001111_b$

- $+610 = 0100110001 0_b$
- $0,94140625 \times 2 = 1,8828125$
  $0,8828125 \times 2 = 1,765625$
  $0,765625 \times 2 = 1,53125$
  $0,53125 \times 2 = 1,0625$
  $0,0625 \times 2 = 0,125$
  $0,125 \times 2 = 0,25$
  $0,25 \times 2 = 0,5$
  $0,5 \times 2 = 1,0$

$+610,94140625 =$

$= 0100110001 0,11110001_b$

a1

$= 1011001111 01,00001110_b$

$+ \quad 1_b$

$1011001111 01,00001111_b$

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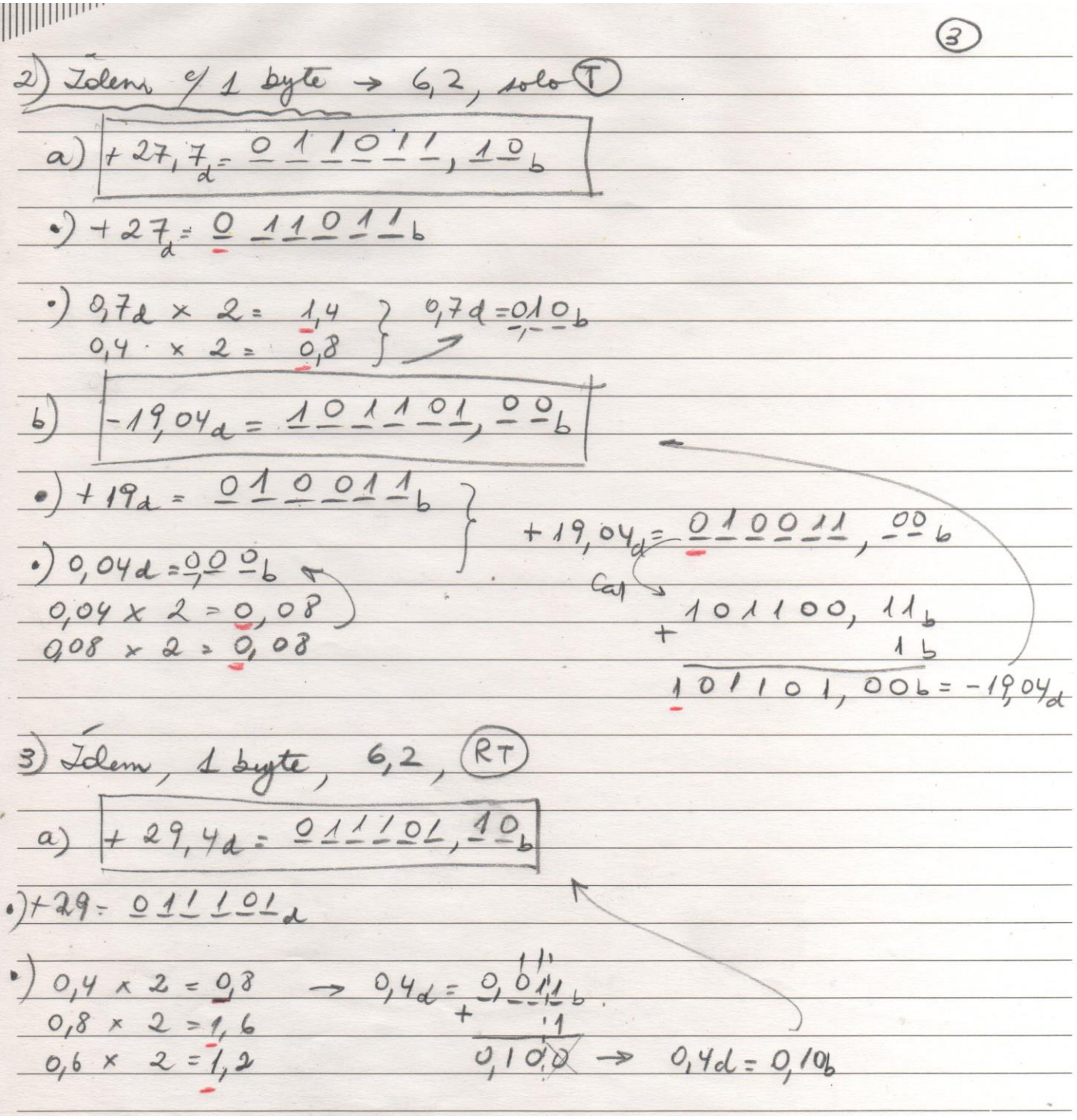

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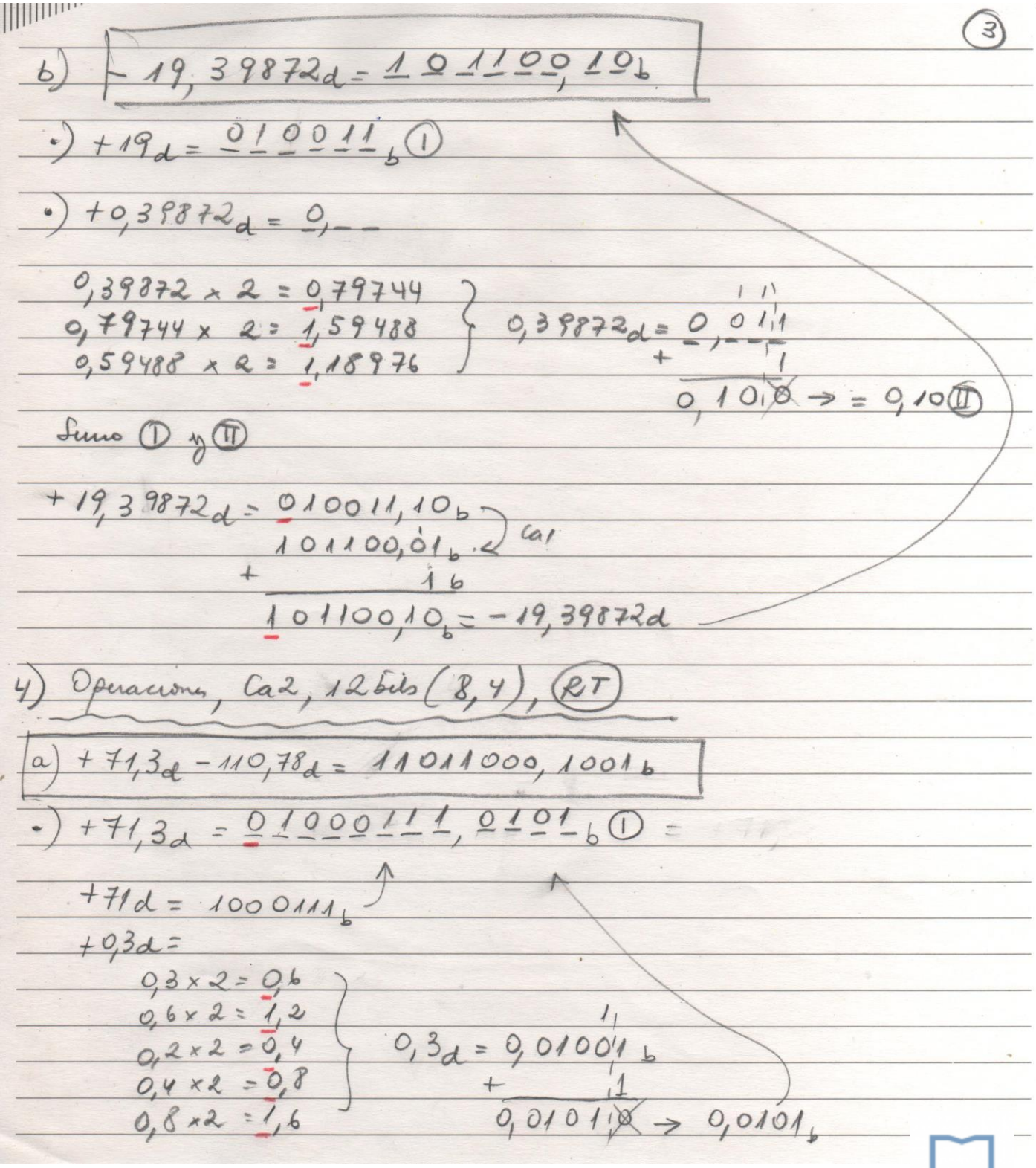

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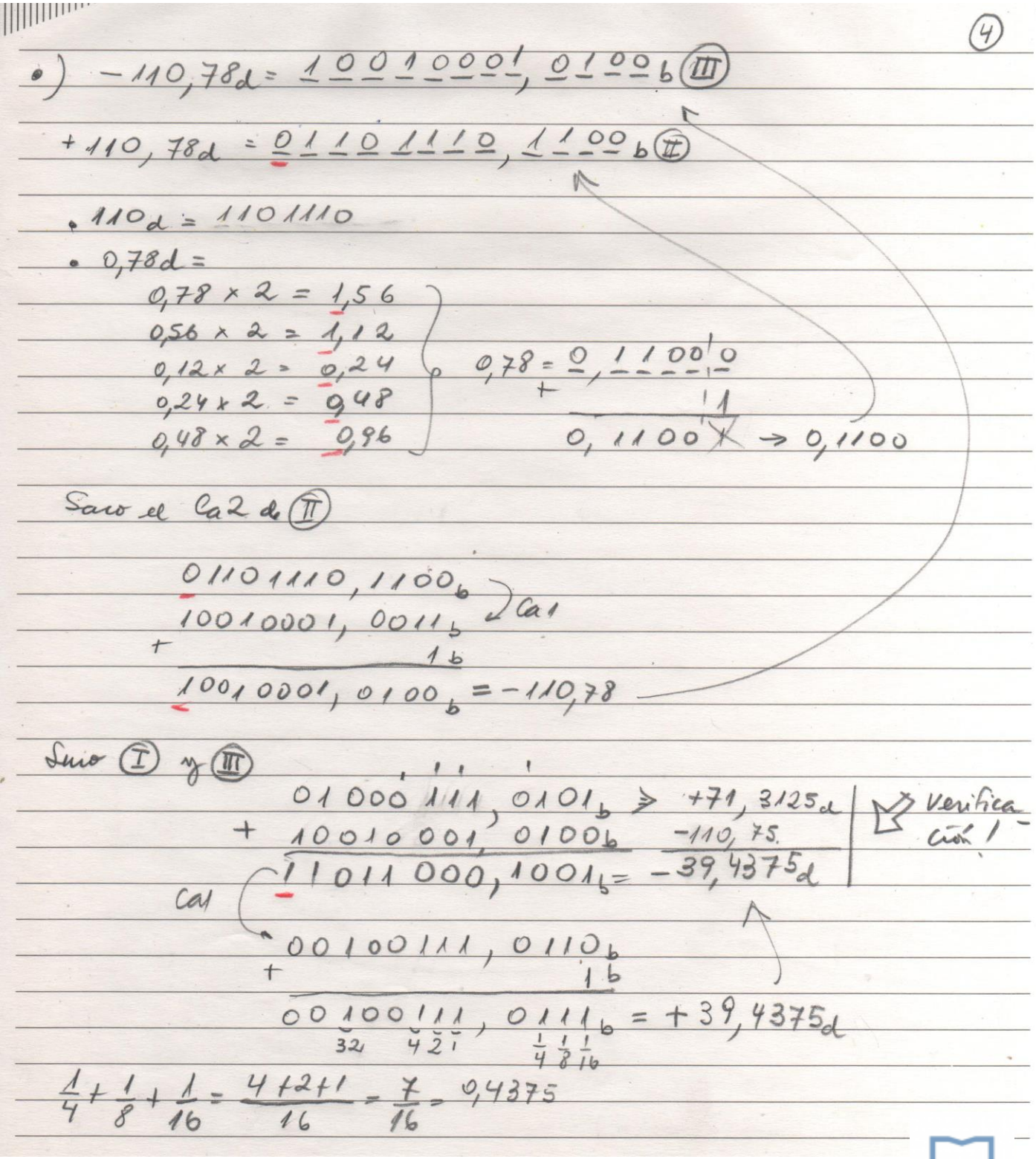

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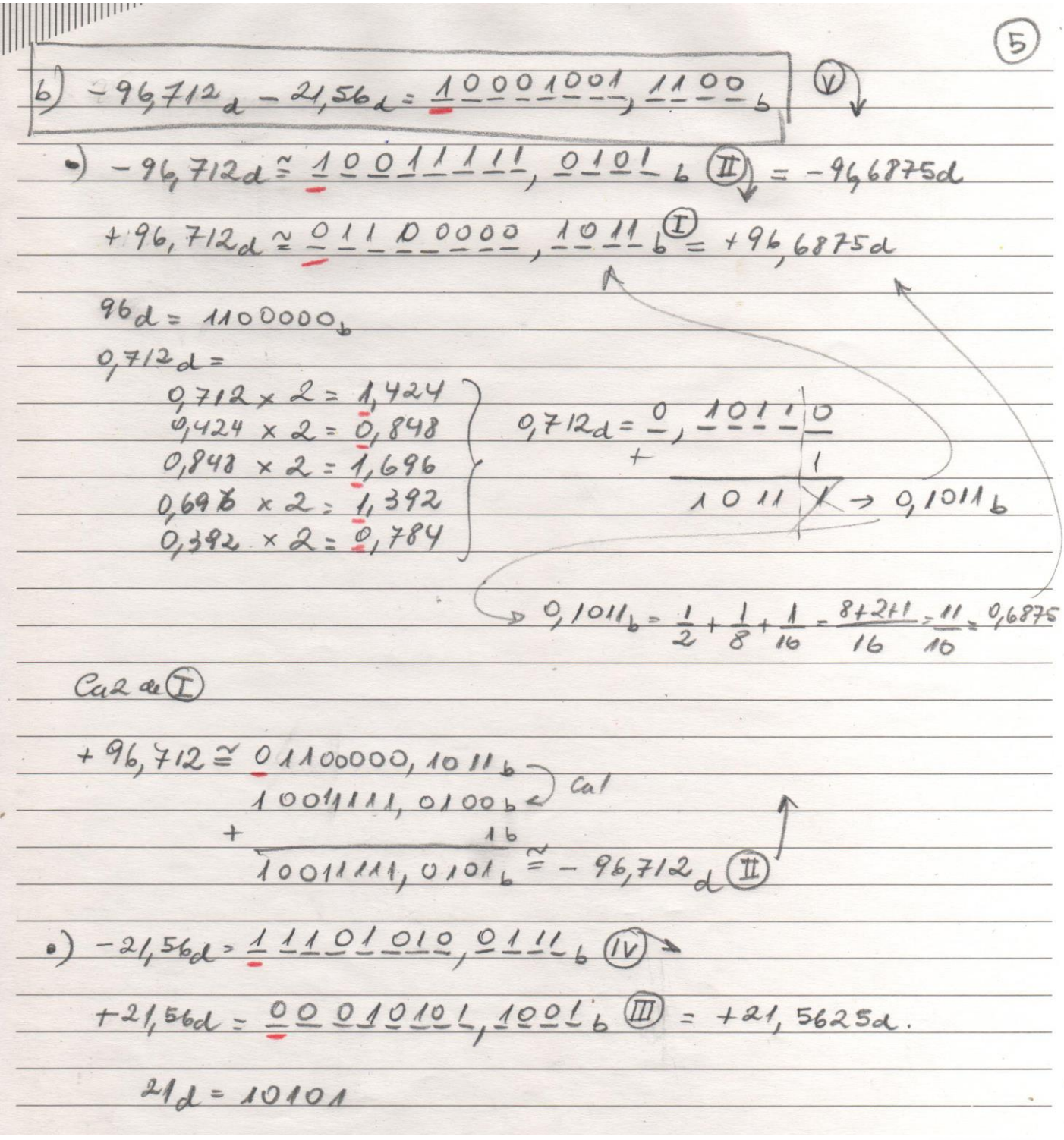

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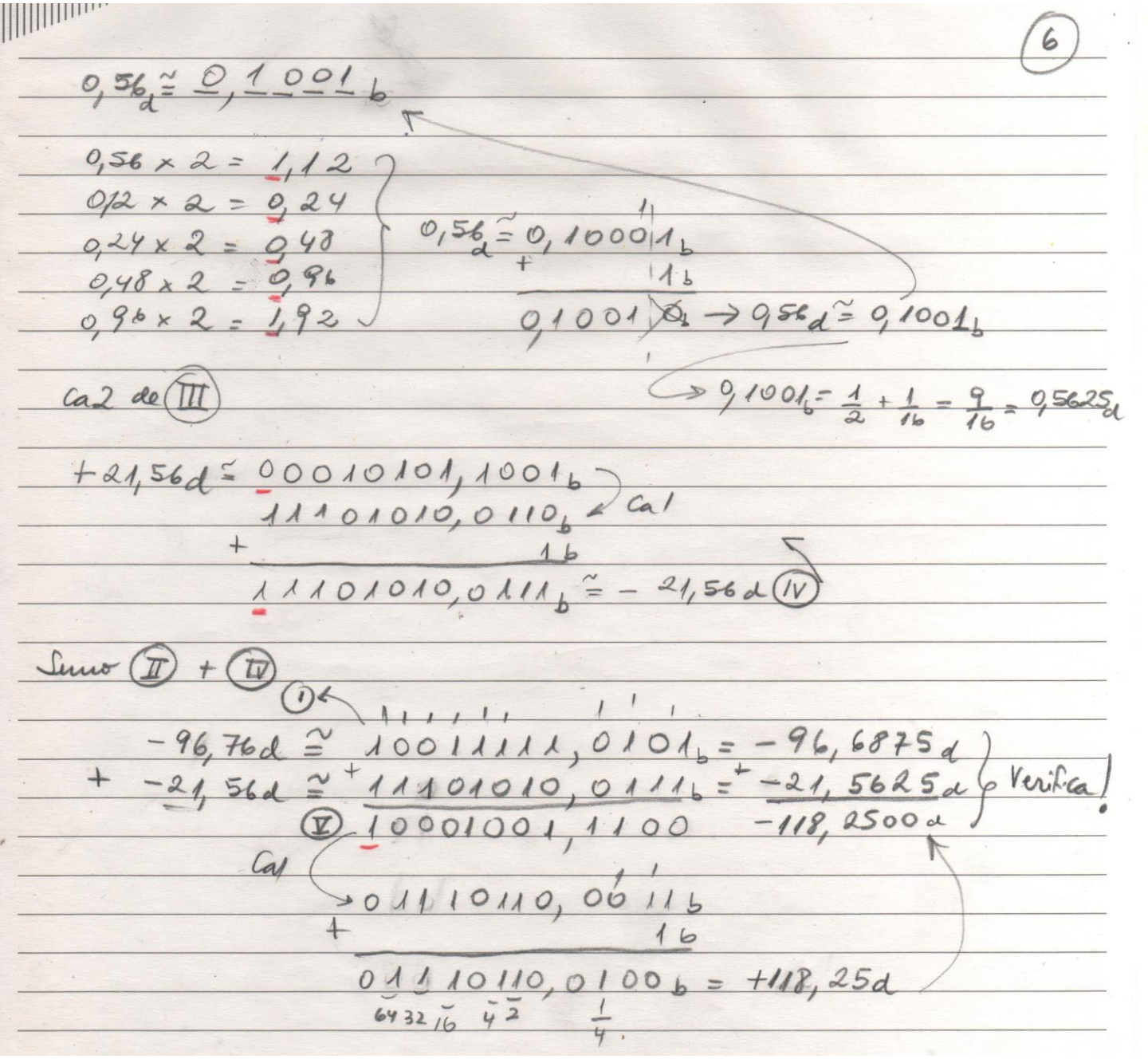

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(7)

c) $+44,81_d + 8,63_d \cong 0\,0\,1\,1\,0\,1\,0\,1, 0\,1\,1\,1_b = +53,4375_d$

-) $+44,81_d \cong 0\,0\,1\,0\,1\,1\,0\,0, 1\,1\,0\,1_b = +44,8125_d$

(I)

- $44_d = 101100_b$
- $0,81_d =$

$0,81 \times 2 = 1,62$
$0,62 \times 2 = 1,24$
$0,24 \times 2 = 0,48$
$0,48 \times 2 = 0,96$
$0,96 \times 2 = 1,92$

$0,81 = 0, 1\,1\,0\,0\,1$
$+ \quad\quad\quad 1$
$0, 1\,1\,0\,1\,0 \rightarrow 0,81 = 0,1101_b$

$0,1101_b = \frac{1}{2} + \frac{1}{4} + \frac{1}{16} = \frac{8+4+1}{16} = \frac{13}{16} = 0,8125_d$

-) $+8,63_d \cong 0\,0\,0\,0\,1\,0\,0\,0, 1\,0\,1\,0_b = +8,625_d$

(II)

-) $8_d = 1000_b$

-) $0,63_d$

$0,63 \times 2 = 1,26$
$0,26 \times 2 = 0,52$
$0,52 \times 2 = 1,04$
$0,04 \times 2 = 0,08$
$0,08 \times 2 = 0,16$

$0,63 = 0, 1\,0\,1\,0\,0$
$+ \quad\quad\quad 1$
$0, 1\,0\,1\,0\,1 \rightarrow 0,1010_b$

$0,1010_b = \frac{1}{2} + \frac{1}{8} = \frac{4+1}{8} = \frac{5}{8} = 0,625_d$

Suma (I) y (II)

$0\,0\,1\,0\,1\,1\,0\,0, 1\,1\,0\,1_b = +44,8125_d$
$+ \; 0\,0\,0\,0\,1\,0\,0\,0, 1\,0\,1\,0_b \quad + 8,625_d$

$0\,0\,1\,1\,0\,1\,0\,1, 0\,1\,1\,1 = +53,4375_d$

Verifica!

(32 16 4 1)

$\frac{1}{4} + \frac{1}{8} + \frac{1}{16} = \frac{4+2+1}{16} = \frac{7}{16} = 0,4375$

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d) $-101,812_d + 66,66_d = 11011100,1110_b = -33,125_d$ (IV)

- $-101,812_d \simeq 10011010,0011_b$ (II) $= -101,8125_d$

$+101,812_d \simeq 01100101,1101_b$ (I)

$101_d = 1100101$

$0,812_d \times 2 = 1,624_d$
$0,624_d \times 2 = 1,248_d$
$0,248_d \times 2 = 0,496_d$
$0,496_d \times 2 = 0,992_d$
$0,992_d \times 2 = 1,984_d$

$0,812_d \simeq 0,1100\,1_b$
$+ \quad 1$
$0,11101 \not\Rightarrow$

$0,812_d \simeq 0,1101_b = \frac{1}{2} + \frac{1}{4} + \frac{1}{16} = \frac{13}{16} = 0,8125_d$

Cal (I)

$01100101,1101_b$
$10011010,0010$ ← cal
$+ \quad 1$
$10011010,0011_b = -101,8125 \simeq -101,812_d$ (II)

- $+66,66_d \simeq 01000010,1011_b = +66,6875_d$ (III)

$66_d = 1000010$

$0,66_d \times 2 = 1,32_d$
$0,32_d \times 2 = 0,64_d$
$0,64_d \times 2 = 1,28_d$
$0,28_d \times 2 = 0,56_d$
$0,56_d \times 2 = 1,12_d$

$0,66_d \simeq 0,1010\,1_b$
$+ \quad 1$
$0,1011 \not\Rightarrow$

$0,1011_b = \frac{1}{2} + \frac{1}{8} + \frac{1}{16} = \frac{8+2+1}{16} = \frac{11}{16} = 0,6875_d$

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