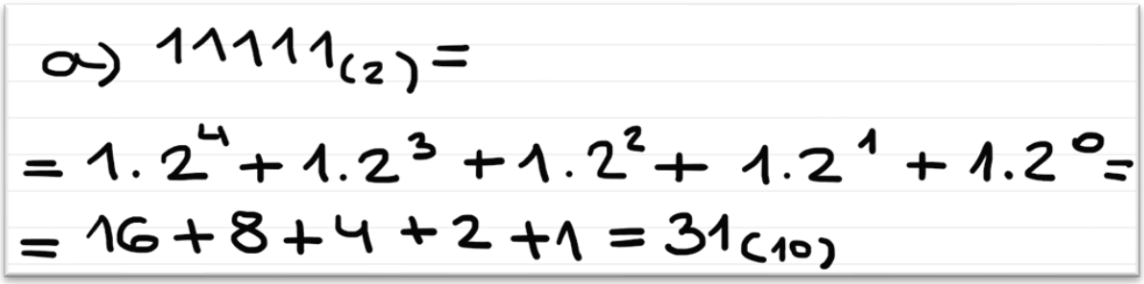
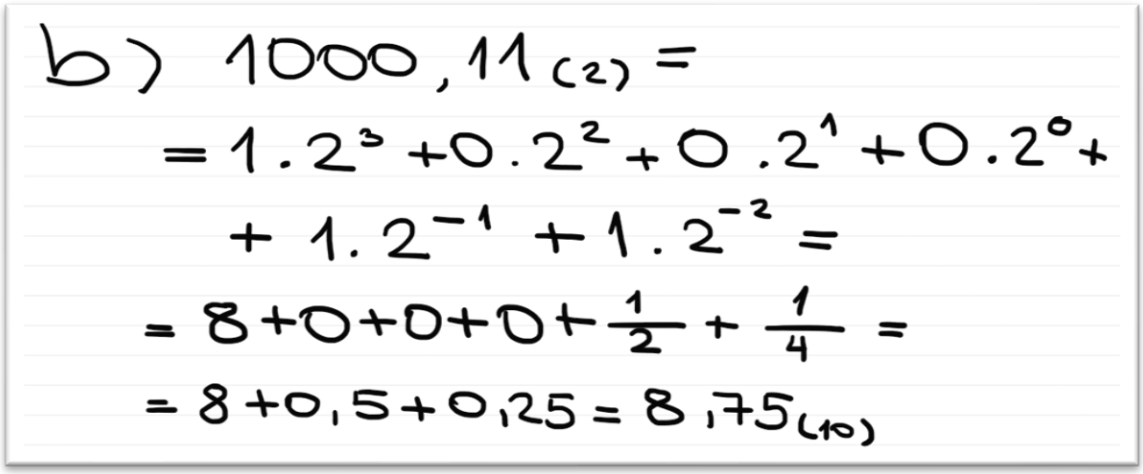
Упражнение: Основни математически концепции - Решения

1. Преобразуване от двоична в десетична бройна система

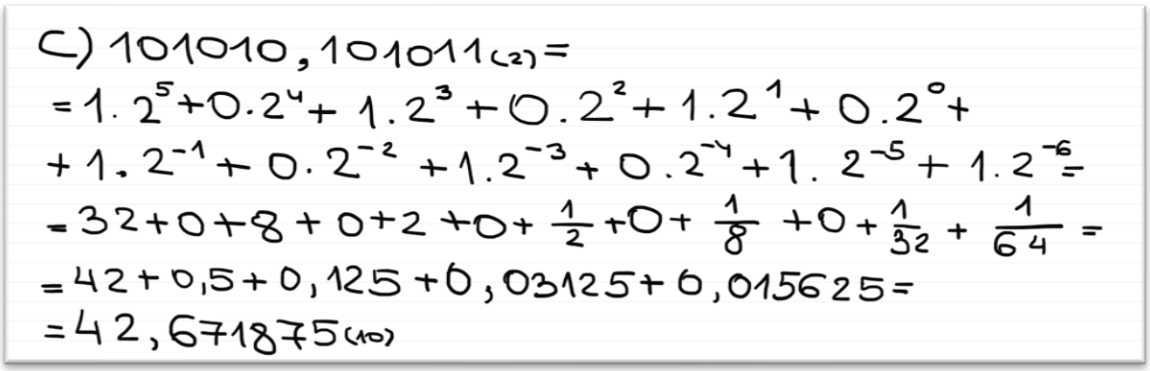
a) $11111_{(2)} = 31_{(10)}$



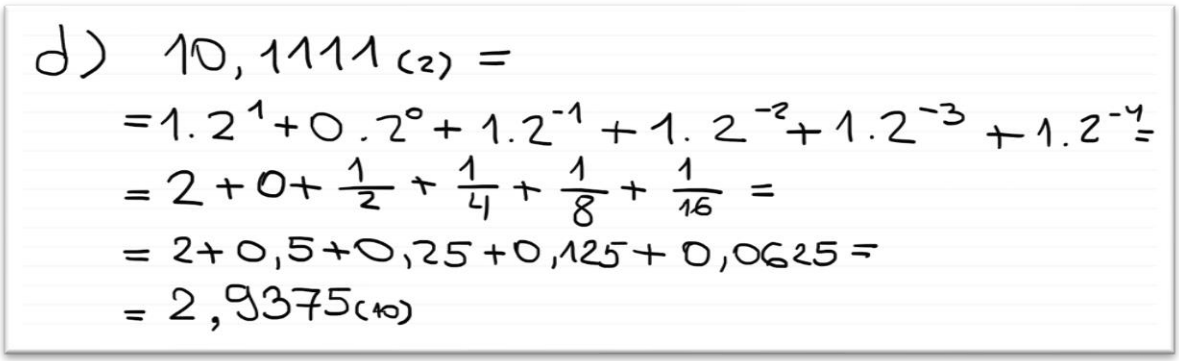
b) $1000{,}011_{(2)} = 8{,}75_{(10)}$



c) $101010{,}101011_{(2)} = 42{,}671875_{(10)}$

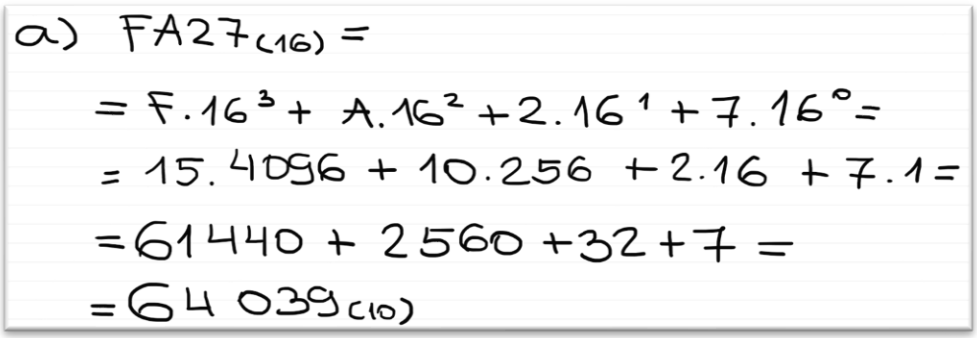


d) $10,1111_{(2)} = 2,9375_{(10)}$

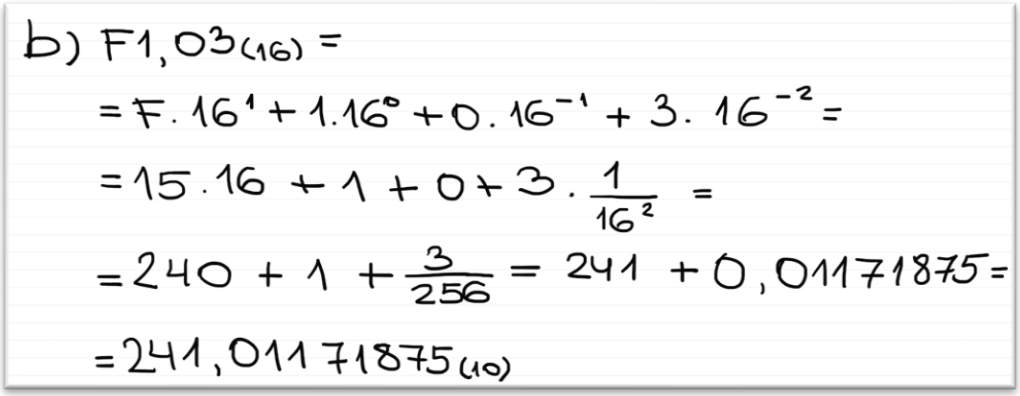


2. Преобразуване от шестнадесетична в десетична бройна система

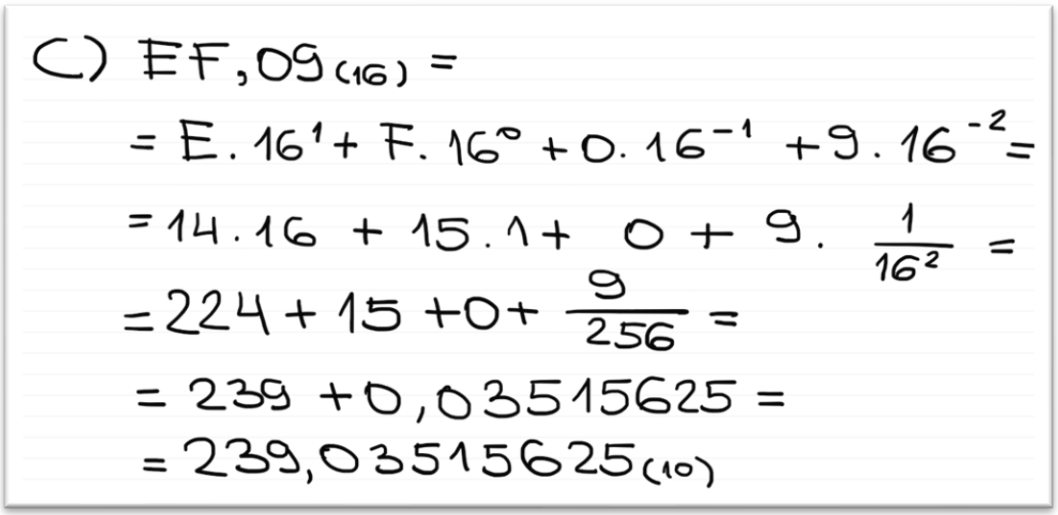
a) $FA27_{(16)} = 64039_{(10)}$



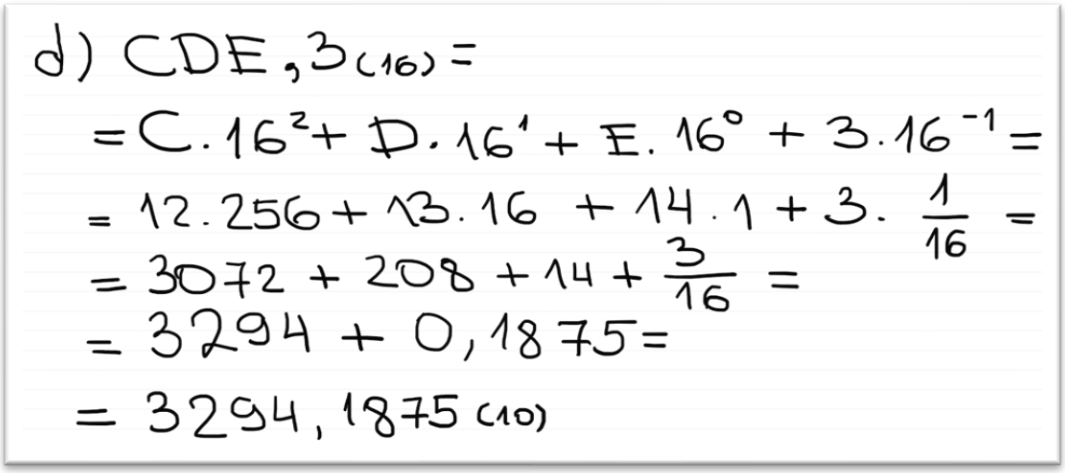
b) $F1,03_{(16)} = 241,01171875_{(10)}$



c) $EF,09_{(16)} = 239.03515625_{(10)}$

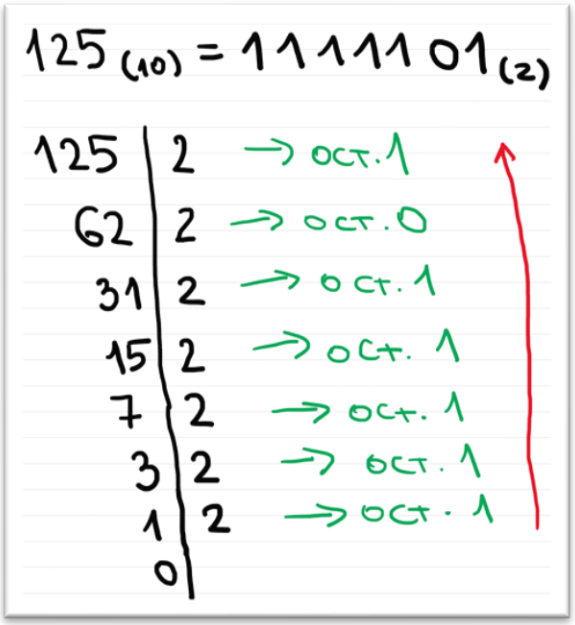


d) $CDE,3_{(16)} = 3294.1875_{(10)}$

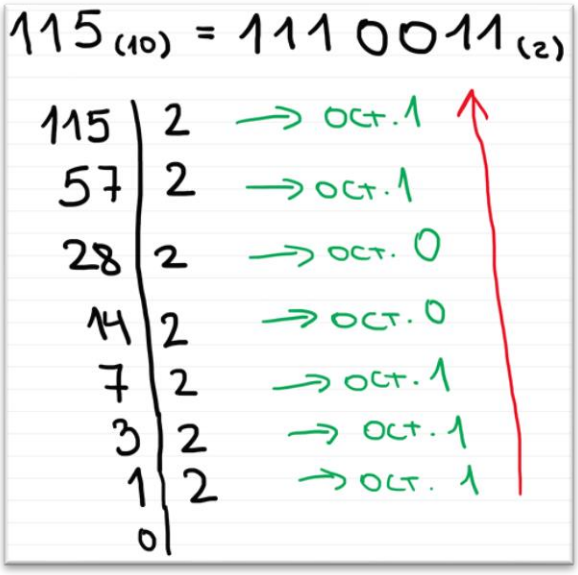


3. Преобразуване от десетична в двоична бройна система

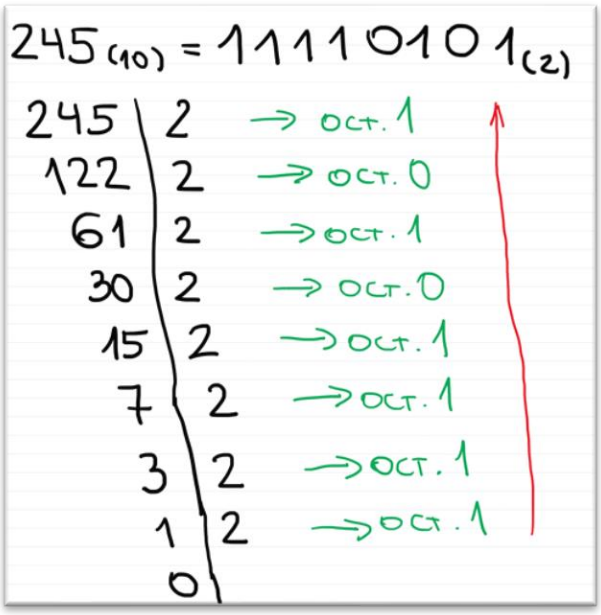
a) $125_{(10)} = 1111101_{(2)}$



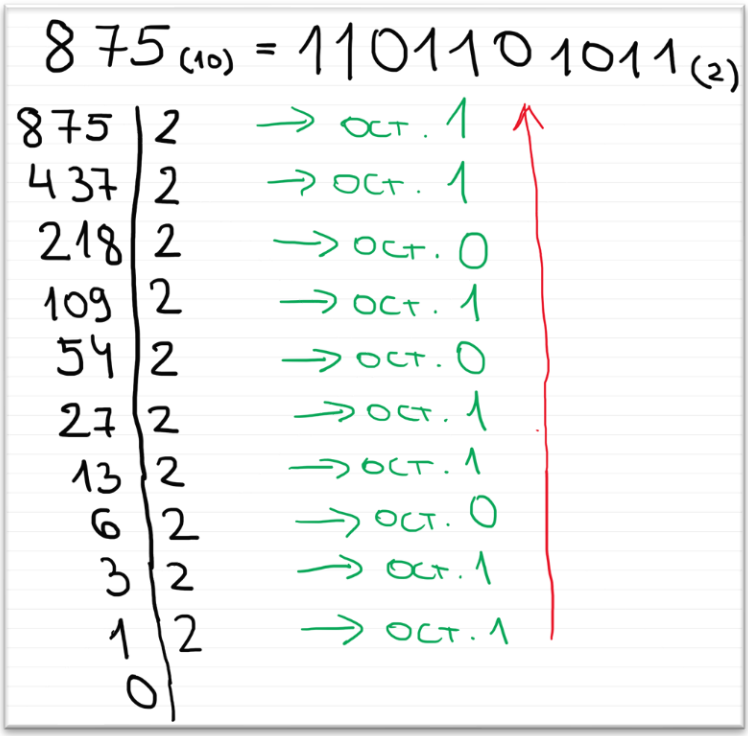
b) $115_{(10)} = 1110011_{(2)}$



c) $245_{(10)} = 11110101_{(2)}$

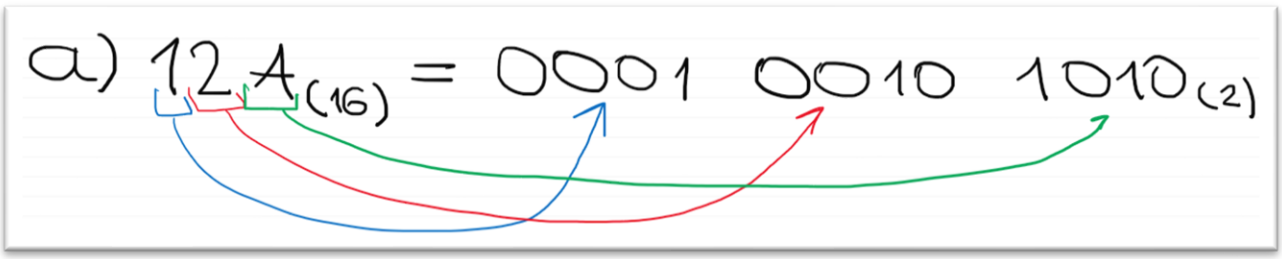


d) $875_{(10)} = 1101101011_{(2)}$

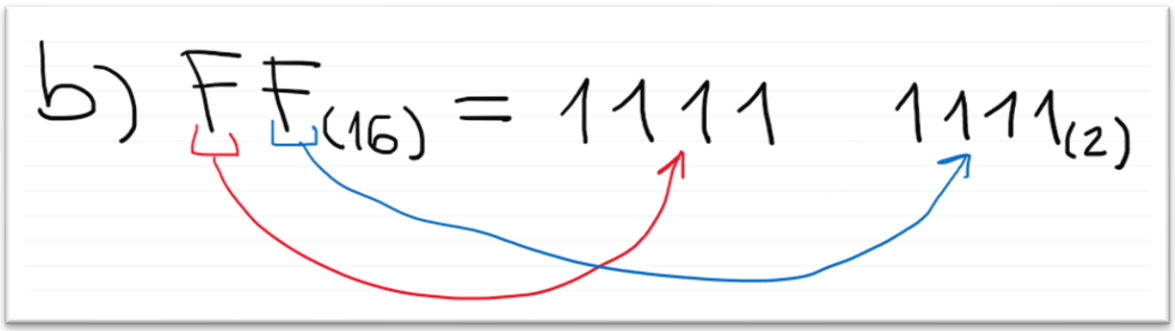


4. Преобразуване от шестнадесетична в двоична бройна система

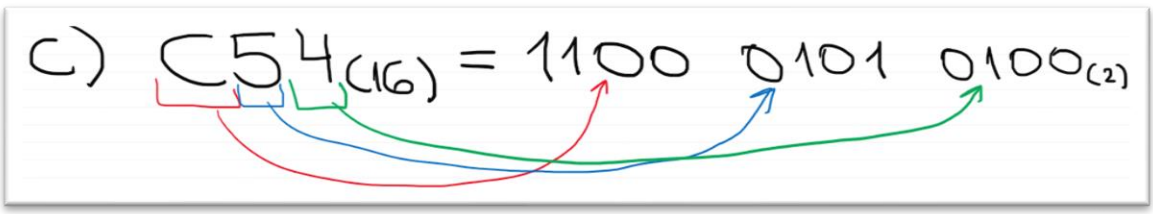
a) $12A_{(16)} = 000100101010_{(2)}$



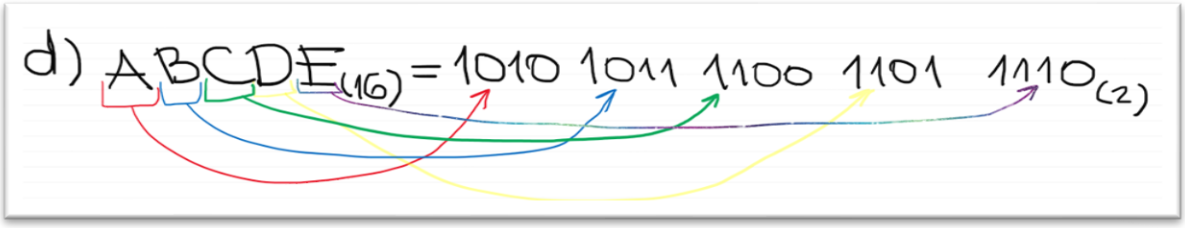
b) $FF_{(16)} = 11111111_{(2)}$



c) $C54_{(16)} = 110001010100_{(2)}$

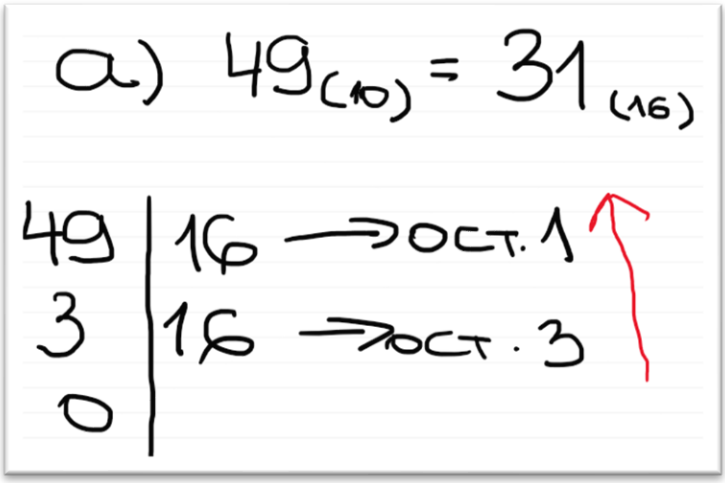


d) $ABCDE_{(16)} = 10101011110011011110_{(2)}$

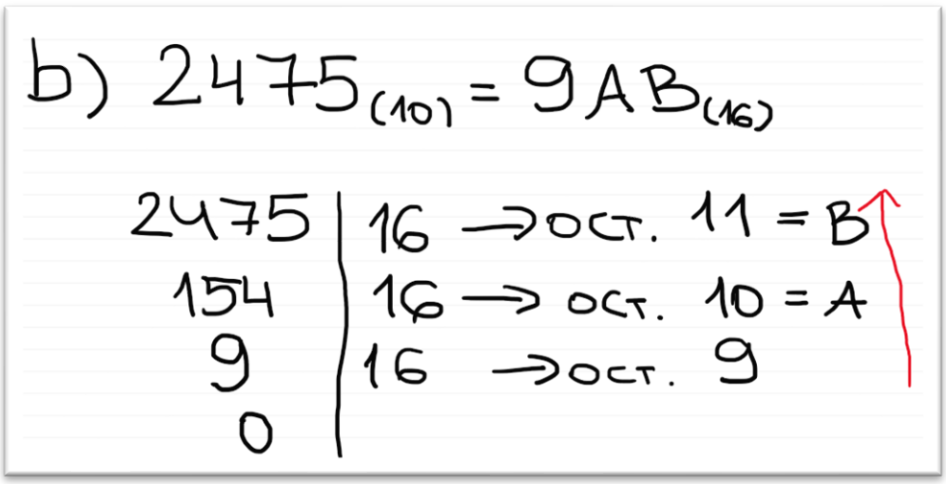


5. Преобразуване от десетична в шестнадесетична бройна система

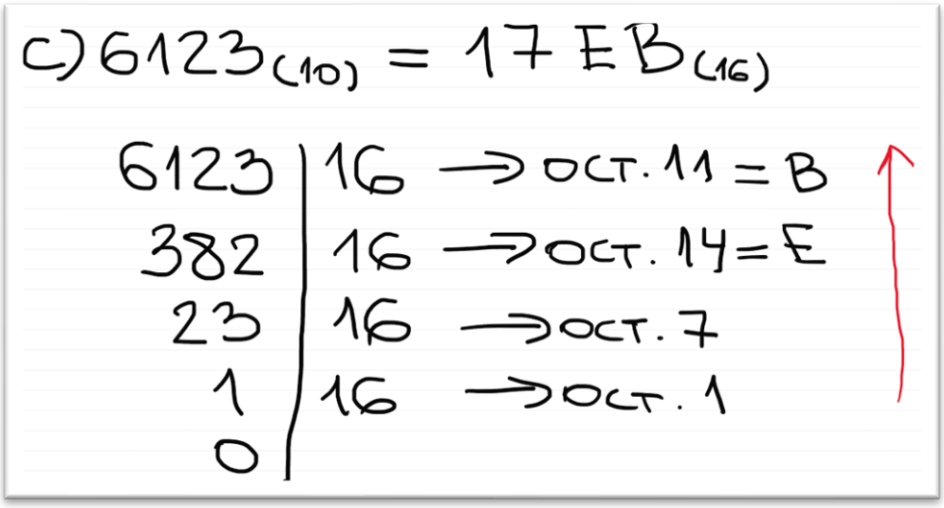
a) $49_{(10)} = 31_{(16)}$



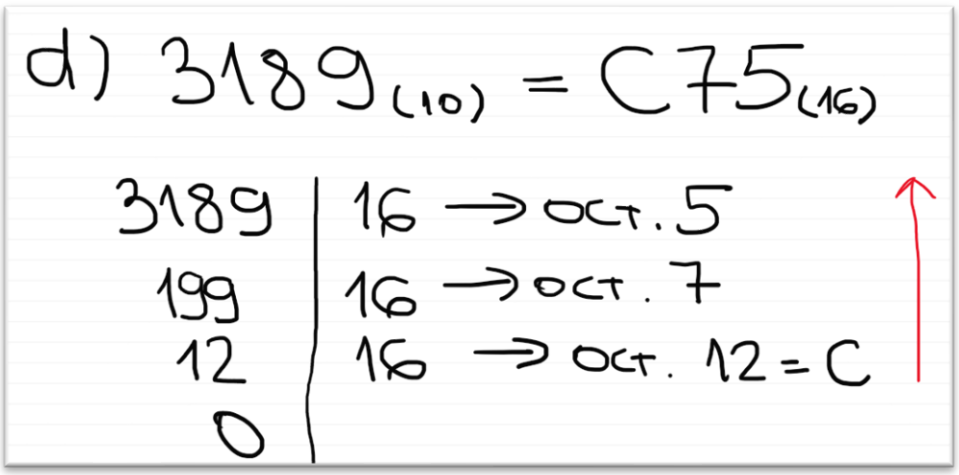
b) $2475_{(10)} = 9AB_{(16)}$



c) $6123_{(10)} = 17EB_{(16)}$

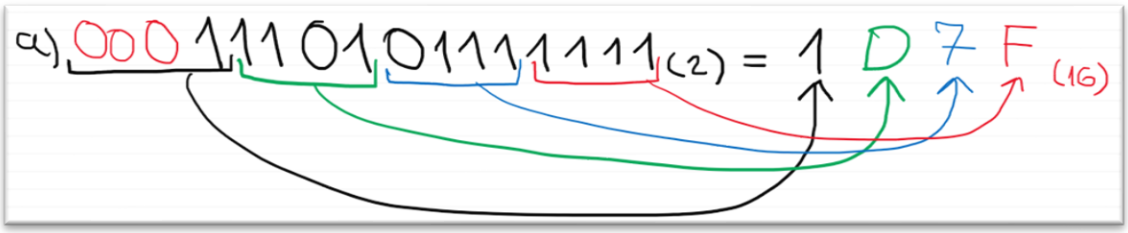


d) $3189_{(10)} = C75_{(16)}$

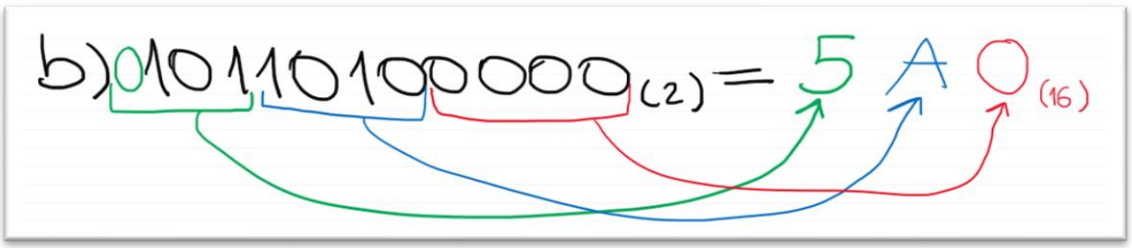


6. Преобразуване от двоична в шестнадесетична бройна система

a) $1110101111111_{(2)} = 1D7F_{(16)}$

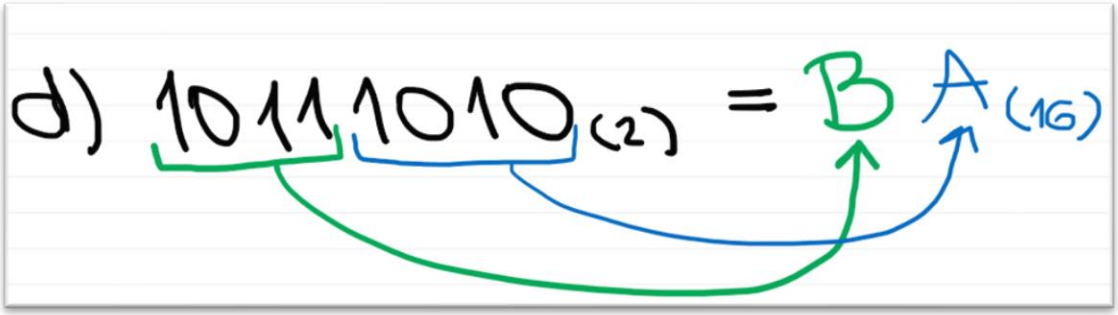


b) $10110100000_{(2)} = 5A0_{(16)}$



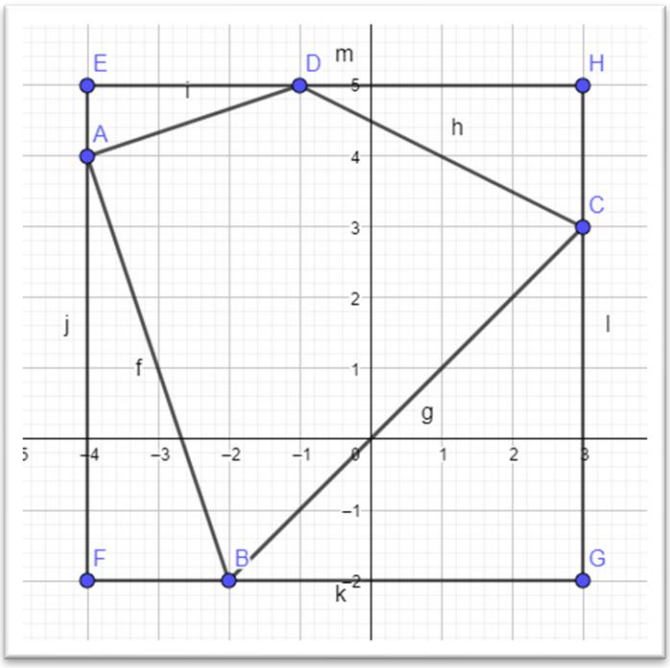
c) $10101101101010101011_{(2)} = ADAAB_{(16)}$

d) $10111010_{(2)} = BA_{(16)}$



7. Координатна система

a) Чертеж:



Решение:

а) Построяване: $E(-4;5)$; $F(-4;-2)$; $G(3;-2)$; $H(3;5)$

$S_{ABCD} = S_{EFGH} - (S_{\Delta DEA} + S_{\Delta AFB} + S_{\Delta BGC} + S_{\Delta CHD})$

① четириъгълник $EFGH$ е квадрат: $EF = FG = GH = HE = 7$ см

$S_{EFGH} = EF^2 = 7^2 = 49$ см^2

② $S_{\Delta DEA} = \frac{DE \cdot DA}{2} = \frac{3 \cdot 1}{2} = 1{,}5$ см^2

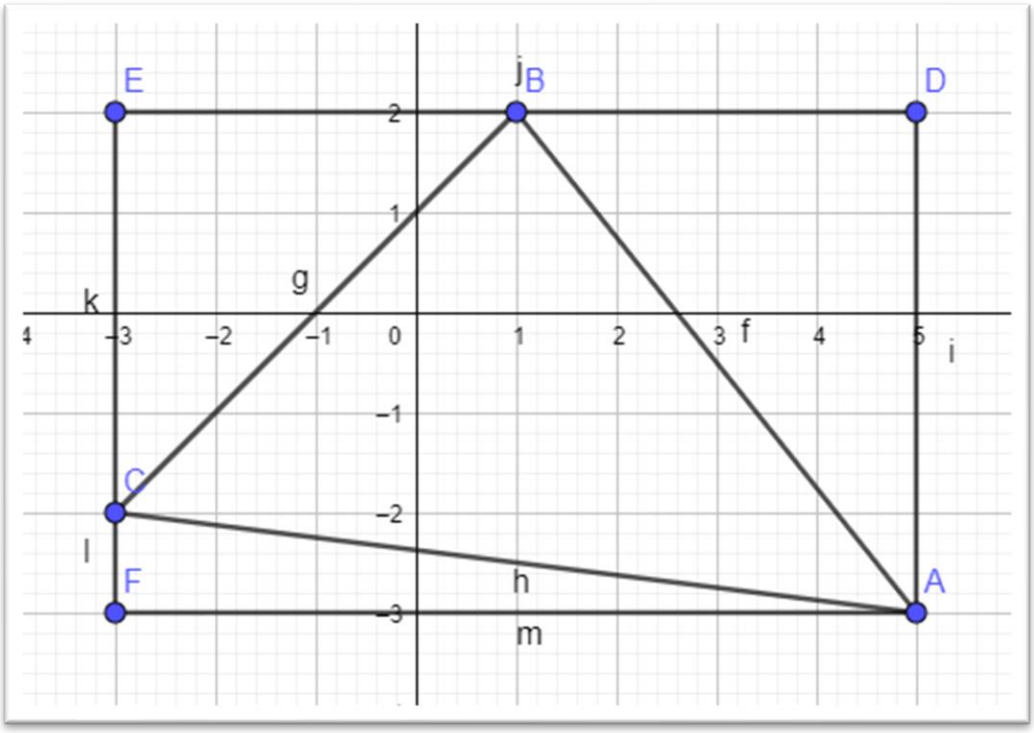
③ $S_{\Delta AFB} = \frac{AF \cdot FB}{2} = \frac{6 \cdot 2}{2} = 6$ см^2

④ $S_{\Delta BGC} = \frac{BG \cdot GC}{2} = \frac{5 \cdot 5}{2} = 12{,}5$ см^2

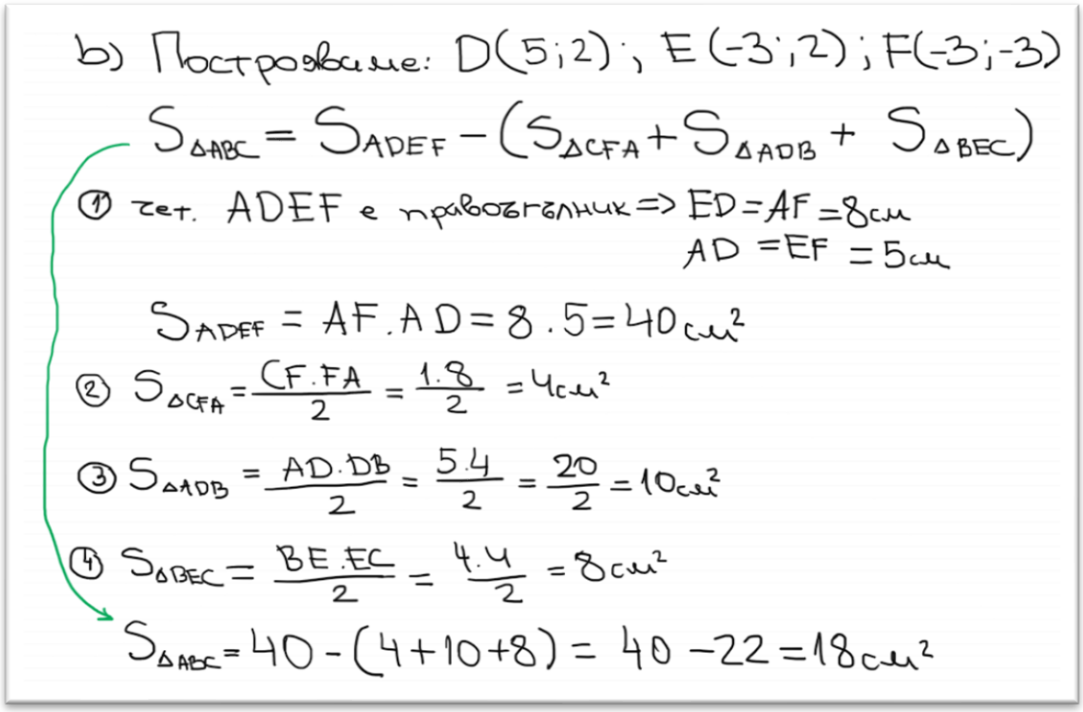
⑤ $S_{\Delta CHD} = \frac{CH \cdot HD}{2} = \frac{2 \cdot 4}{2} = 4$ см^2

$S_{ABCD} = 49 - (1{,}5 + 6 + 12{,}5 + 4) = 25$ см^2

b) Чертеж:

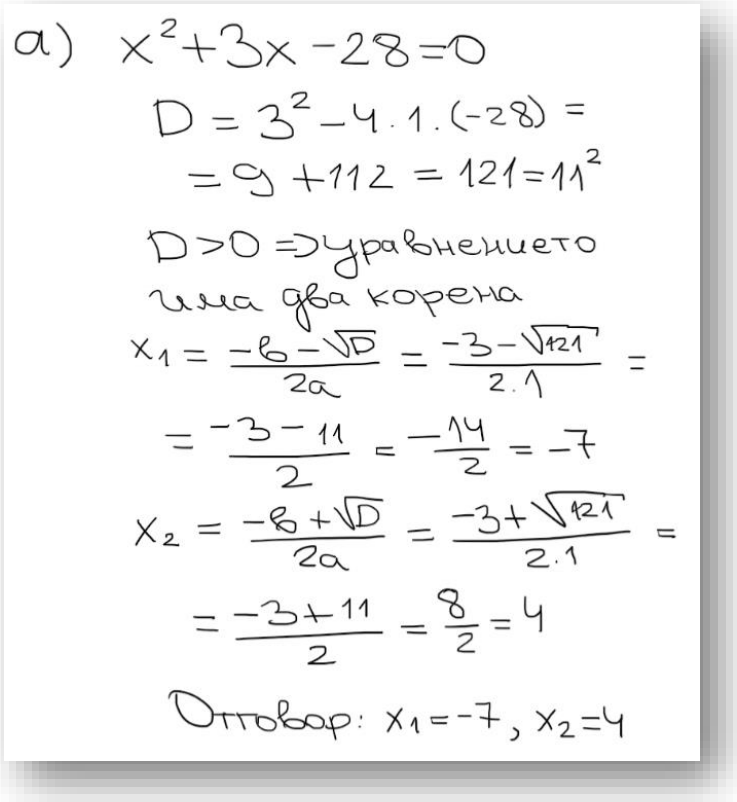


Решение:

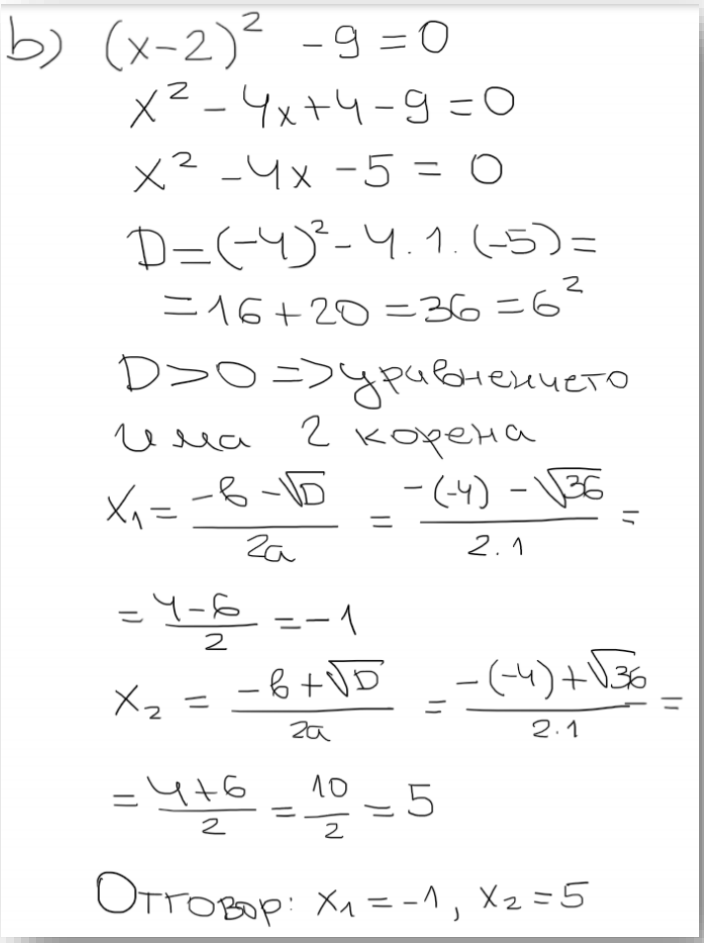


8. Квадратно уравнение

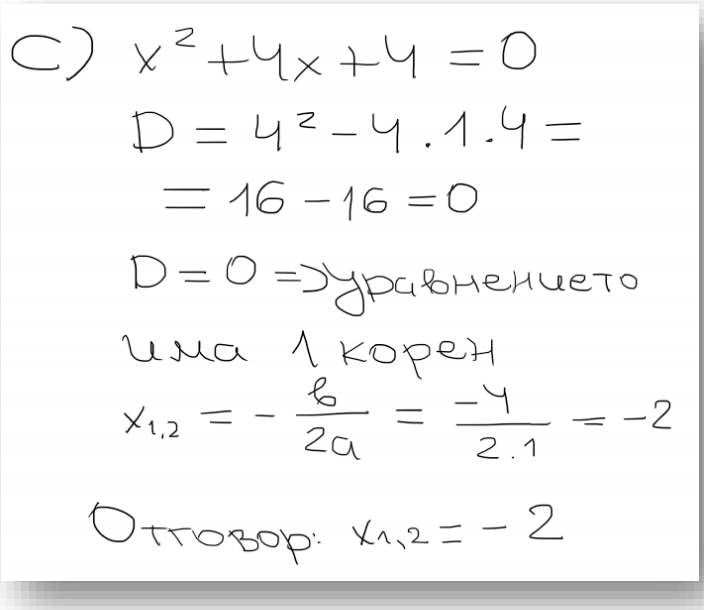
a) $x^2 + 3x - 28 = 0$



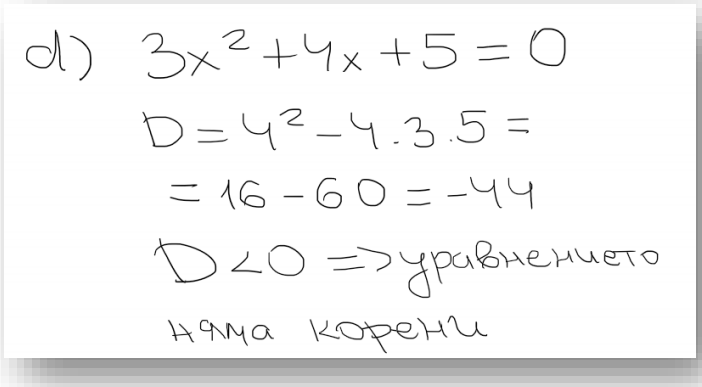
b) $(x - 2)^2 - 9 = 0$



c) $x^2 + 4x + 4 = 0$



d) $3x^2 + 4x + 5 = 0$



e) $2x^4 + 3x^2 - 5 = 0$