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| **Algoritmo 1: Euclides** | | | | |
|  | P1 | a = 412 | b = 260 |  |
| vuelta 1 | P2 | a = 412 | b = 260 | r = 152 |
| P3 | a = 412 | b = 260 | r = 152 != 0 |
| P4 | a = 260 | b = 152 | r = 152 |
| vuelta 2 | P2 | a = 260 | b = 152 | r = 108 |
| P3 | a = 260 | b = 152 | r = 108 != 0 |
| P4 | a = 152 | b = 108 | r = 108 |
| vuelta 3 | P2 | a = 152 | b = 108 | r = 44 |
| P3 | a = 152 | b = 108 | r = 44 != 0 |
| P4 | a = 108 | b = 44 | r = 44 |
| vuelta 4 | P2 | a = 108 | b = 44 | r = 20 |
| P3 | a = 108 | b = 44 | r = 20 != 0 |
| P4 | a = 44 | b = 20 | r = 20 |
| vuelta 5 | P2 | a = 44 | b = 20 | r = 4 |
| P3 | a = 44 | b = 20 | r = 4 != 0 |
| P4 | a = 20 | b = 4 | r = 4 |
| vuelta 6 | P2 | a = 20 | b = 4 | r = 0 |
| P3 | a = 20 | b = 4 | r = **0 == 0** --> return 4 |

**Seguimiento manual de cada algoritmo:**

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| **Algoritmo 2: Euclides Optimizado** | | | | |
|  | P1 | a = 412 | b = 260 |  |
| vuelta 1 | P2 | a = 412 | b = 260 | r = 152 |
| P3 | a = 412 | b = 260 | r = 152 != 0 |
| P4 | a = 412 | b = 260 | r = 152 > 130 --> r = 108 |
| P5 | a = 260 | b = 108 | r = 108 |
| vuelta 2 | P2 | a = 260 | b = 108 | r = 44 |
| P3 | a = 260 | b = 108 | r = 44 != 0 |
| P4 | a = 260 | b = 108 | r = 44 < 54 --> r = 44 |
| P5 | a = 108 | b = 44 | r = 44 |
| vuelta 3 | P2 | a = 108 | b = 44 | r = 20 |
| P3 | a = 108 | b = 44 | r = 20 != 0 |
| P4 | a = 108 | b = 44 | r = 20 < 22 --> r = 20 |
| P5 | a = 64 | b = 20 | r = 20 |
| vuelta 4 | P2 | a = 64 | b = 20 | r = 4 |
| P3 | a = 64 | b = 20 | r = 4 != 0 |
| P4 | a = 64 | b = 20 | r = 4 < 10 --> r = 4 |
| P5 | a = 20 | b = 4 | r = 4 |
| vuelta 5 | P2 | a = 20 | b = 4 | r = 0 |
| P3 | a = 20 | b = 4 | r = **0 == 0** --> return 4 |

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| **Algoritmo 3: Euclides recursivo** | | | |
| llamada 1 | Input | a = 412 | b = 260 |
| If | 260 == 0? F | |
| llamada 2 | Input | a = 260 | b = 152 |
| If | 152 == 0? F | |
| llamada 3 | Input | a = 152 | b = 108 |
| If | 108 == 0? F | |
| llamada 4 | Input | a = 108 | b = 44 |
| If | 44 == 0? F | |
| llamada 5 | Input | a = 44 | b = 20 |
| If | 20 == 0? F | |
| llamada 6 | Input | a = 20 | b = 4 |
| If | 4 == 0? F | |
| llamada 7 | Input | a = 4 | b = 0 |
| If | 0 == 0? **V** --> return 4 | |

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| **Algoritmo 4: Binary GCD recursivo** | | | | |
| llamada 1 | Input | a = 412 | | b = 260 |
| If | |260|>|412|? F | | |
| If | b == 0? F | | |
| If | 412 & 260 pares? V --> return 2\* llamada 2 | | |
| llamada 2 | Input | a = 206 | | b = 130 |
| If | |130|>|206|? F | | |
| If | b == 0? F | | |
| If | 206 & 130 pares? V --> return 2\* llamada 3 | | |
| llamada 3 | Input | a = 103 | | b = 65 |
| If | |65|>|103|? F | | |
| If | b == 0? F | | |
| If | 103 & 65 pares? F | | |
| If | 103 par & 65 impar? F | | |
| If | 103 impar & 65 par? F | | |
| return llamada 4 | | | |
| llamada 4 | Input | a = (|103|-|65|)/2 = 19 | | b = 65 |
| If | |65|>|19|? V --> return llamada 5 | | |
| llamada 5 | Input | a = 65 | | b = 19 |
| If | |65|>|19|? F | | |
| If | b == 0? F | | |
| If | 65 & 19 pares? F | | |
| If | 65 par & 19 impar? F | | |
| If | 65 impar & 19 par? F | | |
| return llamada 6 | | | |
| llamada 6 | Input | a = (|65|-|19|)/2 = 23 | | b = 19 |
| If | |19|>|23|? F | | |
| If | b == 0? F | | |
| If | 23 & 19 pares? F | | |
| If | 23 par & 19 impar? F | | |
|  | If | 23 impar & 19 par? F | | |
| return llamada 7 | | | |
| llamada 7 | Input | a = (|23|-|19|)/2 = 2 | | b = 19 |
| If | |19|>|5|? V --> return llamada 8 | | |
| llamada 8 | Input | a = 19 | | b = 2 |
| If | |2|>|19|? F | | |
| If | b == 0? F | | |
| If | 19 & 2 pares? F | | |
| If | 19 par & 2 impar? F | | |
| If | 19 impar & 2 par? V --> return llamada 9 | | |
| llamada 9 | Input | a = 19 | | b = 1 |
| If | |1|>|19|? F | | |
| If | b == 0? F | | |
| If | 19 & 1 pares? F | | |
| If | 19 par & 1 impar? F | | |
| If | 19 impar & 1 par? F | | |
| return llamada 10 | | | |
| llamada 10 | Input | a = (|19|-|1|)/2 = 9 | | b = 1 |
| If | |1|>|9|? F | | |
| If | b == 0? F | | |
| If | 9 & 1 pares? F | | |
| If | 9 par & 1 impar? F | | |
| If | 9 impar & 1 par? F | | |
| return llamada 11 | | | |
| llamada 11 | Input | a = (|9|-|1|)/2 = 4 | | b = 1 |
| If | |1|>|4|? F | | |
| If | b == 0? F | | |
| If | 4 & 1 pares? F | | |
| If | 4 par & 1 impar? V --> return llamada 12 | | |
| llamada 12 | Input | a = 2 | | b = 1 |
| If | |1|>|2|? F | | |
| If | b == 0? F | | |
| If | 2 & 1 pares? F | | |
| If | 2 par & 1 impar? V --> return llamada 13 | | |
| llamada 13 | Input | a = 1 | | b = 1 |
| If | |1|>|1|? F | | |
| If | b == 0? F | | |
| If | 1 & 1 pares? F | | |
| If | 1 par & 1 impar? F | | |
| If | 1 impar & 1 par? F | | |
| return llamada 14 | | | |
| llamada 14 | Input | a = (|1|-|1|)/2 = 0 | | b = 1 |
| If | |1|>|0|? V --> return llamada 15 | | |
| llamada 15 | Input | a = 1 | | b = 0 |
| If | |0|>|1|? F | | |
| If | b == 0? V --> return a = 1 | | |
| llamada 15 --> … --> llamada 3 = 1 | | | | |
| llamada 3 \* 2 --> llamada 2 = 2 | | | | |
| llamada 2 \* 2 --> llamada 1 = 4 | | | return 4 | |

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| **Algoritmo 5: Binary GCD iterativo** | | | | | | | |
| Input | | | | x = 412 | y = 260 |  |  |
| P1 | | | | x = 412 | y = 260 | g = 1 |  |
| P2 | | vuelta 1 | 412 & 260 pares? | x = 206 | y = 130 | g = 2 |  |
| vuelta 2 | 206 & 130 pares? | x = 103 | y = 65 | g = 4 |  |
| P3 | vuelta 1 | while 1 | x par? F | x = 103 | y = 65 | g = 4 |  |
| while 2 | y par? F | x = 103 | y = 65 | g = 4 |  |
| P3.3 | | x = 103 | y = 65 | g = 4 | t = 19 |
| P3.4 | | x = 19 | y = 65 | g = 4 | t = 19 |
| vuelta 2 | while 1 | x par? F | x = 19 | y = 65 | g = 4 | t = 19 |
| while 2 | y par? F | x = 19 | y = 65 | g = 4 | t = 19 |
| P3.3 | | x = 19 | y = 65 | g = 4 | t = 23 |
| P3.4 | | x = 19 | y = 23 | g = 4 | t = 23 |
| vuelta 3 | while 1 | x par? F | x = 19 | y = 23 | g = 4 | t = 23 |
| while 2 | y par? F | x = 19 | y = 23 | g = 4 | t = 23 |
| P3.3 | | x = 19 | y = 23 | g = 4 | t = 2 |
| P3.4 | | x = 19 | y = 2 | g = 4 | t = 2 |
| vuelta 4 | while 1 | x par? F | x = 19 | y = 2 | g = 4 | t = 2 |
| while 2 | vuelta 1 | x = 19 | y = 1 | g = 4 | t = 2 |
| P3.3 | | x = 19 | y = 1 | g = 4 | t = 9 |
| P3.4 | | x = 9 | y = 1 | g = 4 | t = 9 |
| vuelta 5 | while 1 | x par? F | x = 9 | y = 1 | g = 4 | t = 9 |
| while 2 | y par? F | x = 9 | y = 1 | g = 4 | t = 9 |
| P3.3 | | x = 9 | y = 1 | g = 4 | t = 4 |
| P3.4 | | x = 4 | y = 1 | g = 4 | t = 4 |
| vuelta 6 | while 1 | vuelta 1 | x = 2 | y = 1 | g = 4 | t = 4 |
| vuelta 2 | x = 1 | y = 1 | g = 4 | t = 4 |
| while 2 | y par? F | x = 1 | y = 1 | g = 4 | t = 4 |
| P3.3 | | x = 1 | y = 1 | g = 4 | t = 0 |
| P3.4 | | x = 0 | y = 1 | g = 4 | t = 0 |
| P4 | return (g\*y) = 4\*1 = 4 | | | | | | |

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| **Algoritmo 6: GCD** | | |
| vuelta 1 | a = 412 | b = 260 |
| vuelta 2 | a = 152 | b = 260 |
| vuelta 3 | a = 152 | b = 108 |
| vuelta 4 | a = 44 | b = 108 |
| vuelta 5 | a = 44 | b = 64 |
| vuelta 6 | a = 44 | b = 20 |
| vuelta 7 | a = 24 | b = 20 |
| vuelta 8 | a = 4 | b = 20 |
| vuelta 9 | a = 4 | b = 16 |
| vuelta 10 | a = 4 | b = 12 |
| vuelta 11 | a = 4 | b = 8 |
| vuelta 12 | a = 4 | b = 4 |
| return a = 4 | | |