

# Hexadecimal Addition Explanation

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Hexadecimal addition is similar to addition in the decimal system but uses base-16 instead of base-10. In hexadecimal, digits range from 0 to F, where A = 10, B = 11, C = 12, D = 13, E = 14, and F = 15 in decimal. When performing hexadecimal addition, you add the digits similarly to decimal addition, but once the sum reaches 16 (or more), you carry over to the next place value.

Steps to Add Hexadecimal Numbers:

1. Add the rightmost digits (least significant digits).
2. If the sum is less than 16, write the result under the line.
3. If the sum is 16 or more, subtract 16 from the result, write the remainder, and carry over 1 to the next column.
4. Repeat for each pair of digits, moving left through the hexadecimal number.

Example 1: Simple Addition Without Carryover

Let's add the hexadecimal numbers 3A and 45:

```
  3A
+ 45
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```

Step-by-step:



|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|  
|-----|

|\*\*0\*\*| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E |  
F |

|\*\*1\*\*| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |  
10 |

|\*\*2\*\*| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | 10 |  
11 |

|\*\*3\*\*| 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | 10 | 11 |  
12 |

|\*\*4\*\*| 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | 10 | 11 |  
12 | 13 |

|\*\*5\*\*| 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | 10 | 11 | 12 |  
13 | 14 |

|\*\*6\*\*| 6 | 7 | 8 | 9 | A | B | C | D | E | F | 10 | 11 | 12 | 13 |  
14 | 15 |

|\*\*7\*\*| 7 | 8 | 9 | A | B | C | D | E | F | 10 | 11 | 12 | 13 | 14 |  
15 | 16 |

|\*\*8\*\*| 8 | 9 | A | B | C | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 |  
16 | 17 |

|\*\*9\*\*| 9 | A | B | C | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 |  
17 | 18 |

|\*\*A\*\*| A | B | C | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 |  
17 | 18 | 19 |

| **\*\*B\*\*** | B | C | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |  
18 | 19 | 1A |

| **\*\*C\*\*** | C | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |  
19 | 1A | 1B |

| **\*\*D\*\*** | D | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |  
1A | 1B | 1C |

| **\*\*E\*\*** | E | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1A |  
1B | 1C | 1D |

| **\*\*F\*\*** | F | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1A | 1B  
| 1C | 1D | 1E |