

Hex ↔ Binary ↔ Decimal Cheat Sheet

1. Hex ↔ Binary Mapping Table

0 = 0000 1 = 0001 2 = 0010 3 = 0011
4 = 0100 5 = 0101 6 = 0110 7 = 0111
8 = 1000 9 = 1001 A = 1010 B = 1011
C = 1100 D = 1101 E = 1110 F = 1111

2. Binary ↔ Decimal

- Binary → Decimal: Multiply bits by powers of 2.
 - Decimal → Binary: Divide by 2 repeatedly, read remainders bottom-up.
- Shortcut (8-bit place values): 128, 64, 32, 16, 8, 4, 2, 1.

3. Hex ↔ Decimal

- Hex → Decimal: Multiply digits by powers of 16.
 - Decimal → Hex: Divide by 16 repeatedly, convert remainders.
- Shortcut powers: $16^1=16$, $16^2=256$, $16^3=4096$, $16^4=65,536$.

4. Mental Shortcuts

- Binary ↔ Hex is fastest (group 4 bits).
- Hex ↔ Decimal is second fastest (use 16 powers).
- Binary ↔ Decimal directly is slower unless weights are memorized.