1. Convert the following from decimal to binary

• 1

128 64 32 16 8 4 2 1

0 0 0 0 0 0 0 1

0b00000001 = 1

• 42

128 64 32 16 8 4 2 1

0 0 1 0 1 0 1 0

0b00101010 = 42

• 256

256 128 64 32 16 8 4 2 1

1 0 0 0 0 0 0 0 0

0b10000000 = 1

• 4,294,967,296

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4294967296 | 2147483648 | 1073741824 | 536870912 | 268435456 | 134217728 | 67108864 | 33554432 | 16777216 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
| 8388608 | 4194304 | 2097152 | 1048576 | 524288 | 262144 | 131072 | 65536 | 32768 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
| 16384 | 8192 | 4096 | 2048 | 1024 | 512 | 256 | 128 | 64 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  |  |  |  |  |  |  |  |  |
| 32 | 16 | 8 | 4 | 2 | 1 |  |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |  |  |  |

0b100000000000000000000000000000000 = 1

2. Convert the following from binary to decimal

• 10000000

128 64 32 16 8 4 2 1

1 0 0 0 0 0 0 0

128 + 0 + 0 + 0 + 0 + 0 + 0 + 0 = **128**

• 10101010

128 64 32 16 8 4 2 1

1 0 1 0 1 0 1 0

128 + 0 + 32 + 0 + 8 + 0 + 2 + 0 = **170**

• 11110000

128 64 32 16 8 4 2 1

1 1 1 1 0 0 0 0

128 + 64 + 32 + 16 + 0 + 0 + 0 + 0 = **240**

• 11001100128 64 32 16 8 4 2 1

1 1 0 0 1 1 0 0

128 + 64 + 0 + 0 + 8 + 4 + 0 + 0 = **204**