

Base Two

[1] We discussed base two in class. Convert the base ten numbers 12, 27, and 64 to base two. Convert these base two numbers to base ten: 1010, and 101011.

[2] Can you figure out how to write the base ten number 0.5 in base two? How about 0.12?

Hint: You know the base ten number 1368 means

$$1368 = 1 \times 10^3 + 3 \times 10^2 + 6 \times 10^1 + 8 \times 10^0 .$$

You also know that if you have decimals that you use negative powers of ten, so that 27.19 means

$$27.19 = 2 \times 10^1 + 7 \times 10^0 + 1 \times 10^{-1} + 9 \times 10^{-2} .$$

What you need to do is figure out how to handle decimals in base two! It probably has something to do with $2^{-1}, 2^{-2}, \dots$.