Example. Convert a very small (in absolute value) decimal number to binary form.

Consider a small value $x = 0.\ 67055225372314453125 \times 10^{-6} =$ 0.00000067055225372314453125.

To convert x to binary form, multiply x by 2^{18} as a first try. (Note: Use the exponent 18 for base 2 because it is 3 times of the exponent from base 10, due to the estimate $2^{10} = 1024 \approx 10^3$, and the exponent ratio is $\frac{10}{3} \approx 3$):

$(0.\ 67055225372314453125 \times 10^{-6}) \cdot (2^{18}) = 0.17578125.$

Try a few more until the result becomes > 1:

$(0.\ 67055225372314453125 \times 10^{-6}) \cdot (2^{19}) = 0.3515625$

$(0.\ 67055225372314453125 \times 10^{-6}) \cdot (2^{20}) = 0.703125$

$(0.\ 67055225372314453125 \times 10^{-6}) \cdot (2^{21}) = \underline{1}.40625 = y.$

equals 2^{-21}

We then multiply the decimal portion of the value y by 2, then repeating the process:

$0.40625 \times 2 = \underline{0}.8125$

equals 2^{-22}

$0.8125 \times 2 = \underline{1}.625$

equals 2^{-23}

$0.625 \times 2 = \underline{1}.25$ (the "1" equals 2^{-24})

$0.25 \times 2 = \underline{0}.5$ (the "0" equals 2^{-25})

$0.5 \times 2 = \underline{1}.0$ (the "1" equals 2^{-26})

Therefore,

$x = 0.\ 67055225372314453125 \times 10^{-6} = 2^{-21} + 2^{-23} + 2^{-24} + 2^{-26} = 101101 \times 2^{-21}$