

# UNIT 1. RATIONAL AND IRRATIONAL NUMBERS

## HISTORY

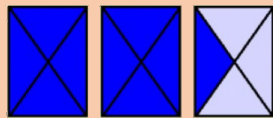
The name of **fraction** is due to **Juan de Luna** who translated Al – Kwharizmi arithmetic book's. He use the word "fractio" in order to translate the Arabic word "al – Kasr" whose mean is break.

The **Egyptians** were the first using fractions, although they only used fractions whose numerator was 1, so the general form was  $1/n$ . However, the **Babylonians** used fractions whose denominator was 60 and they established good approximations with decimals.

The **Hindus** established the rules of operations with fractions and, also, the wrote fractions like us but they didn't use the line between the numerator and the denominator. This line was used for the first time by the **Arabians**. After, **Fibonacci** was the first **European** using the line.

## CURIOUS FACT

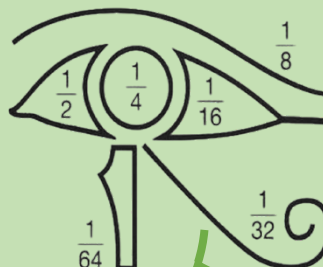
In other countries, improper fractions are replaced by **mixed numbers**. A mixed number is a whole number and a proper fraction represented together.


$$\frac{9}{4} = 2\frac{1}{4}$$

## "EYE OF HORUS"

The "Eye of Horus" is one of the most popular amulet in Egypt due to it protects you. The "Eye of Horus" was considered by the Egyptians as the whole. They used it as a fractional numeral system and each part represented a fraction.

**Did the eye of hours represent the unit?**



## VOCABULARY & EXPRESSIONS

**Fraction:** Fracción

**Numerator:** Numerador

**Denominator:** Denominador

**Proper fraction:** Fracción propia

**Improper fraction:** Fracción impropia

**Equivalent fractions:** Fracciones equivalentes

**1/2:** One half; **1/3:** One third

**a/b:** a over b

**Irreducible fraction:** Fracción irreducible

**Lowest common multiple:** mínimo común múltiplo

**Decimal number:** Número decimal

**Integer part:** Parte entera

**Decimal part:** Parte decimal

**Exact decimal:** Decimal exacto

**Recurring decimal:** Decimal periódico

**Pure recurring decimal:** Decimal periódico puro

**Mixed recurring decimal:** Decimal periódico mixto

**Repetend:** periodo

**Non-repeating part:** anteperiodo

**Rational numbers:** N<sup>os</sup> racionales

**Irrational numbers:** N<sup>os</sup> irracionales

**Closed interval:** Intervalo cerrado

**Open interval:** intervalo abierto

**Half-open interval:** intervalo semiabierto

**Half-line:** semirrecta

## CAN YOU GUESS THE INTERVAL?

Using intervals we can represent different situations and they tell us which numbers are in each option that we imagine. Now, we are going to work with them like conditions.

"You can go to the disco if you have 18 years or more"  $\rightarrow [18, +\infty)$

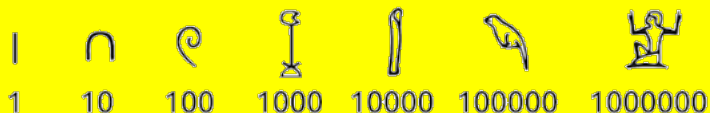
"Cartoons are recommended for children between 2 and 13 years old"  $\rightarrow (2, 13)$



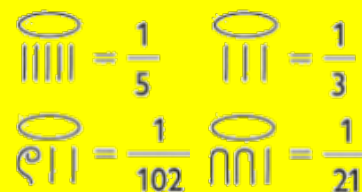
Imagine with the pupils some situations and represent them!

## WRITE FRACTIONS LIKE EGYCIANS

The ancient Egyptians used the following symbols in order to write numbers.



When they started to write fractions, they also used these symbols. Their fractions always have 1 as numerator, so these are some examples of fractions:



Can you write these fractions like Egypcias?

$$\frac{1}{18}; \quad -\frac{1}{123}; \quad \frac{1}{22436}$$

## PUZZLE

Move a number and you will get two equivalent fractions.

$$\frac{\begin{array}{|c|} \hline 2 \\ \hline \end{array} \begin{array}{|c|} \hline 1 \\ \hline \end{array}}{\begin{array}{|c|} \hline 3 \\ \hline \end{array}} = \frac{\begin{array}{|c|} \hline 2 \\ \hline \end{array} \begin{array}{|c|} \hline 1 \\ \hline \end{array}}{\begin{array}{|c|} \hline 9 \\ \hline \end{array}}$$

