

# Exemples de documents inconnus pour l'épreuve d'examen

## Exemple 1

### Improper fractions and mixed numbers

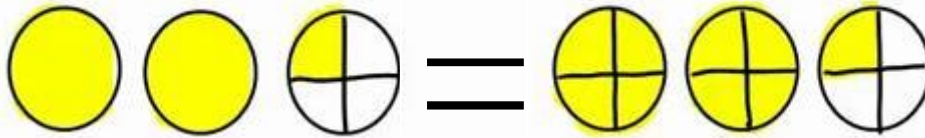
An improper fraction is a positive fraction that is expressed with a numerator and a denominator, the numerator being greater than the denominator. A mixed number is a number expressed as the sum of a whole number and a proper fraction, which is a positive fraction that is expressed with a numerator and a denominator, the numerator being smaller than the denominator.

Examples:

$\frac{12}{7}$  is an improper fraction

A mixed number is usually written:  $2\frac{1}{3}$ , which is equal to  $2 + \frac{1}{3}$ , that is to say equal to the improper fraction  $\frac{7}{3}$ .

1. Give an example of proper fraction. Justify.
2. What improper fraction is involved in the sketch below ? What mixed number is concerned?



3. Write the fraction  $\frac{29}{6}$  under the form of a mixed number.
4. A pupil says to the teacher: "An improper fraction or a mixed number, it's the same thing." What do you think of this assertion?
5. Could you find:
  - a. a decreasing sequence of proper fractions?
  - b. an increasing sequence of proper fractions?
  - c. a decreasing sequence of improper fractions?
  - d. an increasing sequence of improper fractions?

## Exemple 2

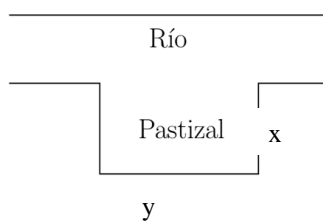
### área y perímetro



Un granjero desea vallar un terreno rectangular de pasto adyacente a un río.  
El pastizal debe tener 180000 metros cuadrados para producir suficiente forraje par su ganado.  
Desea optimizar la cantidad de valla, que cuesta bastante, sabiendo que el lado que da al río no necesita ser vallado.

Llamamos  $x$  lo ancho del terreno e  $y$  lo largo en hm.

Sea  $P$  la función que da la cantidad de valla.

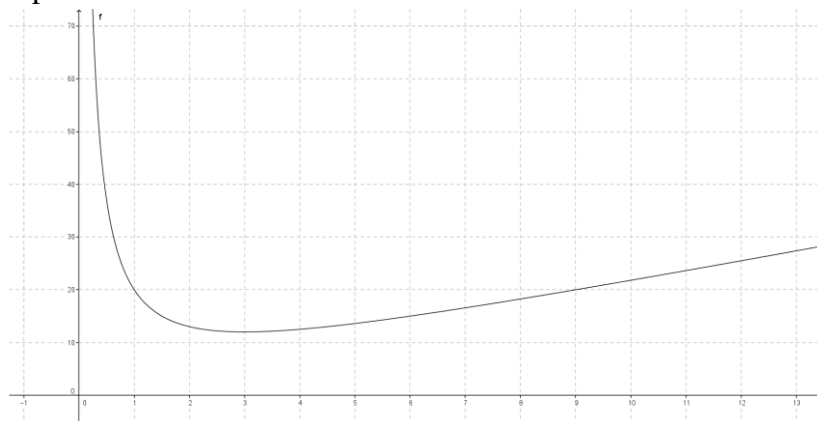


1. Justificar las siguientes relaciones :

$$xy = 18$$

$$P = 2x + y = 2x + \frac{18}{x}$$

2. La gráfica siguiente representa la función  $P$



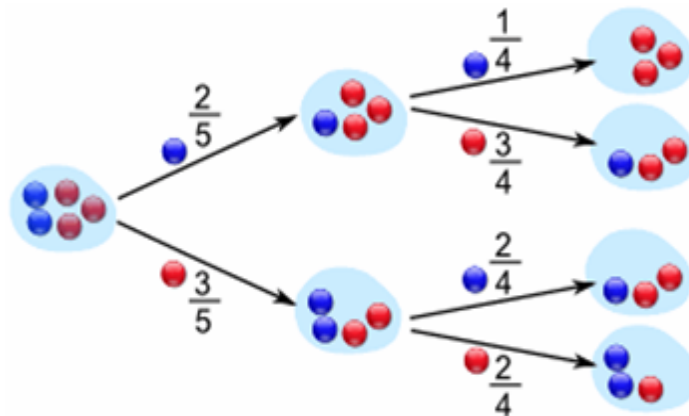
¿cuál es la cantidad de valla que tiene que comprar el granjero ?

¿cuáles son las dimensiones del pastizal ?

3. Presentar un método para calcular el mínimo de esta función y conocer los valores exactos de las dimensiones.

### Example 3

## A tree diagram

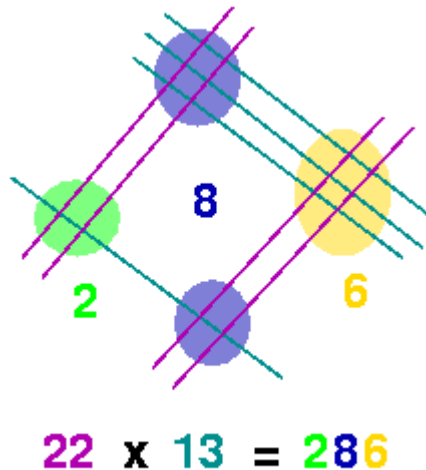


1. Describe an experiment linked to the tree diagram above.
2. Explain the values of the fractions on the branches of the tree.
3. Let  $X$  be the random variable equal to the number of blue balls obtained at the end of this experiment.
  - a. What are the possible values of  $X$ ?
  - b. Give the probability distribution of  $X$ .

## Example 4

# Line multiplication method

The following document is extracted from a website:  
Here's a way to multiply numbers visually!



Suppose you want to multiply 22 by 13. Draw 2 lines slanted upward to the right, and then move downward to the right a short distance and draw another 2 lines upward to the right. Then draw 1 line slanted downward to the right, and then move upward to the right a short distance and draw another 3 lines slanted downward to the right.

Now count up the number of intersection points in each corner of the figure. The number of intersection points at left (2) will be the first digit of the answer. Sum the number of intersection points at the top and bottom of the square ( $6+2=8$ ); this will be the middle digit of the answer. The number of intersection points at right (6) will be the last digit of the answer.

This will work to multiply any two two-digit numbers, but if any of the numbers of intersection have 10 or more points in them, be sure to carry the tens digit to the left, just as you would if you were adding.

Source : <https://www.math.hmc.edu/funfacts/ffiles/10006.1.shtml>

1. By describing this method in your own words, use it to compute  $12 * 23$ .
2. Use this method to compute  $25 * 43$ .
3. Explain why this method gives the right answer.