

2023-2024

Mathématiques

FISE 1

Léo RACLET

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LES FONDAMENTAUX

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1 Mathématiques

1.1 Blocs de couleurs

Théorème: THÉORÈME DE PYTHAGORE (OUI)

In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the catheti.

$$a^2 + b^2 = c^2$$

In mathematics, the Pythagorean theorem, also known as Pythagoras' theorem (see theorem 1.1), is a relation in Euclidean geometry among the three sides of a right triangle.

Preuve:

If $x = y = \sqrt{2}$ is an example, then we are done ; otherwise $\sqrt{2}^{\sqrt{2}}$ is irrational, in which case taking $x = \sqrt{2}^{\sqrt{2}}$ and $y = \sqrt{2}$ gives us :

$$\left(\sqrt{2}^{\sqrt{2}}\right)^{\sqrt{2}} = \sqrt{2}^{\sqrt{2}\sqrt{2}} = \sqrt{2}^2 = 2.$$

Lemme: IDENTITÉ DE BÉZOUT

Let a and b be nonzero integers and let d be their greatest common divisor. Then there exist integers x and y such that :

$$ax + by = d$$

Définition :

If we want dummy text in our document then we generally search for lorem ipsum text generators and copy-paste those texts/paragraphs in our document.

EXEMPLE :

In LaTeX, we don't need to do such copy and paste thing. LaTeX has different packages which automatically generates dummy text in our document. You can generate them with just a few lines of code.

REMARQUE :

In the example below, lipsum package is used to print dummy text below chapter title. `lipsum[2-4]` prints lorem ipsum text from paragraph 2 to paragraph 4

Propriété :

Every line in your source code must end with otherwise your algorithm will continue on the same line of text in the output.

```
1  # libraries:
2  import numpy as np
3  import pandas as pd
4  import matplotlib.pyplot as plt # creating the variables:
5  x = np.linspace(0,100)
6  y = x**2 # plotting
7  plt.plot(x, y, '-b')
```

Important !

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Algorithme 1 : An algorithm with caption**Data** : $n \geq 0$ **Result** : $y = x^n$ $y \leftarrow 1;$ $X \leftarrow x;$ $N \leftarrow n;$ **while** $N \neq 0$ **do** **if** N *is even* **then** $X \leftarrow X \times X;$ $N \leftarrow \frac{N}{2};$

/* This is a comment */

else **if** N *is odd* **then** $y \leftarrow y \times X;$ $N \leftarrow N - 1;$ **Exercice :**

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Rappel

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Ordre bien fondé

Un ordre est bien fondé s'il n'existe pas de suite infiniment strictement décroissante, i.e. toute partie non vide de E admet un élément minimal.

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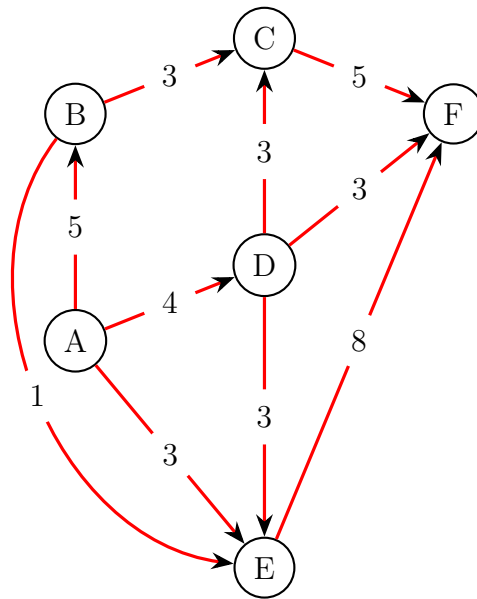


FIGURE 1.1 – This is a real beautiful figure of a graph

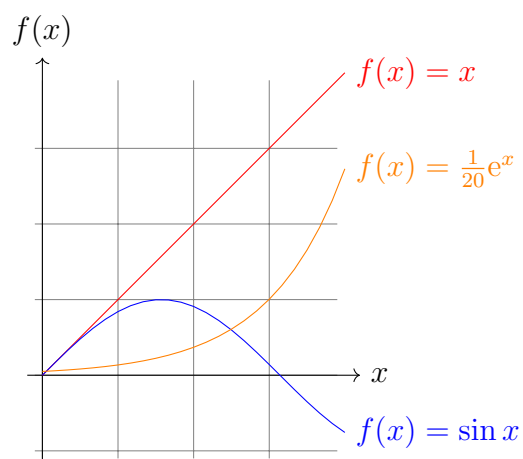


FIGURE 1.2 – Trigonometric circle

