Exercice #1

Translate into french :

1. A monotonic decreasing function is a function *f* with domain and range that are sets of real numbers, such that the output value decreases or stays the same as the input value increases.

2. If *f* is a strictly decreasing function, two different input values can not have the same output value.

3. A number *x* is a local minimum of a function *f* if *f*(*x*) is less than or equal to *f*(*y*) for all numbers *y* in a neighbourhood of *x*.

4. As the absolute value function is an even function, its graph is symmetrical about the *y*-axis.

Exercice #2

Translate into english :

1. Les seules fonctions définies sur $\mathbb{R}$, qui sont à la fois croissantes et décroissantes, sont les fonctions constantes.

2. Une fonction affine définie sur un intervalle donné est croissante sur cet intervalle si, et seulement si, son coefficient directeur est supérieur ou égal à 0.

3. Deux nombres opposés ont la même valeur absolue.

4. La fonction valeur absolue admet un minimum global strict en 0 et l'ensemble de ses images est $\mathbb{R}_+$.

In exercice 3 and 4 you must be as precise and clear as possible and you must explain/prove your answers/results.

Exercice #3

Let *f* be the function defined by : $f(x)=\frac{-x^2+1}{x^2-16}$.

1. Give the domain of *f*.
2. Prove that *f* is an even function on its domain.

Exercice #4

Let *f* be the function defined by : $f(x)=|x-2|-|5-x|$.

1. Give the domain of *f*.
2. Using a sign-table, express *f*(*x*) without the modulus within 3 intervals.
3. Is *f* an even or odd function ?
4. Is *f* a monotonic function ?
5. Give the range of *f*.
6. Draw the graph of *f* in an orthonormal system of axes.