I – Let f be the function defined by $f(x) = -\frac{1}{4}x^2 + \frac{1}{2}x + 2$.

Let f_1, f_2, f_3, f_4 be the functions associated to f, defined by the following relationships :

$f_1(x) = -f(x)$; $f_2(x) = f(-x)$; $f_3(x) = -f(-x)$, $f_4(x) = f(x-2)+1$

Draw the five parabolas P, P_1, P_2, P_3, P_4 of the five functions on the same graph below.

(Chose carefully the position of the origin to be able to show the curves properly, and use 5 different colors)

Explain which geometrical tranformation of (P) correspond to each of these 4 new parabolas.

II – Let h be the function defined by $h(x)=\frac{2-x}{2+x}$.

Let h_1, h_2, h_3, h_4 be the functions associated to h, defined by the following relationships :

$h_1(x) = |\, h(x)\,|$; $h_2(x) = h(|x|)$; $h_3(x) = |h(-x)|$, $h_4(x) = h(x-2)+1$

Draw the five Hyperbolas H, H_1, H_2, H_3, H_4 of the five functions on the same graph below.

(Chose carefully the position of the origin to be able to show the curves properly, and use 5 different colors)

Explain which geometrical tranformation of (H) correspond to each of these 4 new Hyperbolas.