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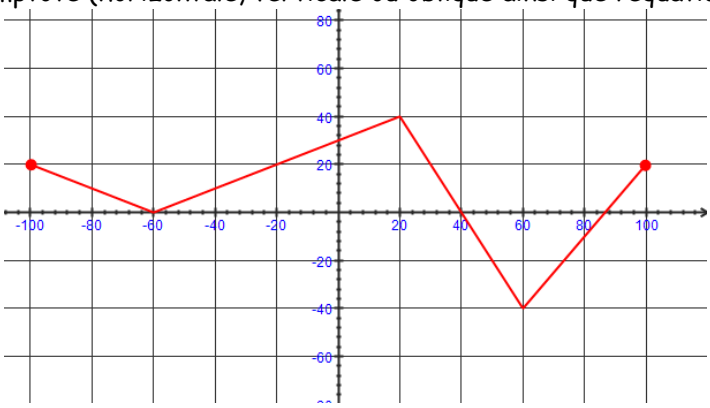
Exercice : Donne les propriétés de chaque fonction : domaine, image, zéros, variation (croissance, décroissance), signe, asymptote (horizontale, verticale ou oblique ainsi que l'équation de celle-ci).

a)



$D = [-100, 100]$

$I = [-40, 40]$

zéros :

$x = -60, 40, 88$

$y = 30$

$\nearrow$: $[-60, 20] \cup [60, 100]$

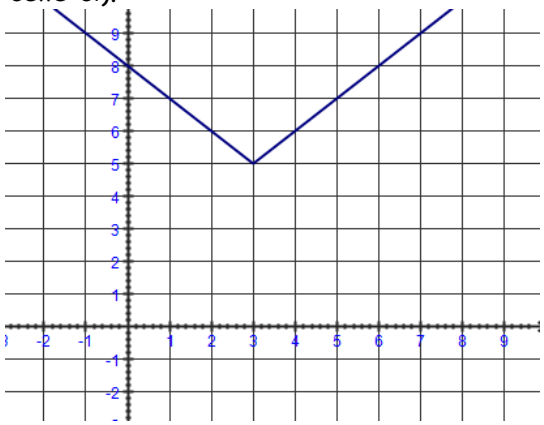
$\searrow$: $[-100, -60] \cup [20, 60]$

$+$: $[-100, 40] \cup [88, 100]$

$-$: $[40, 88]$

Aucune asymptote

b)



$D =]-\infty, \infty[$

$I = [5, \infty[$

zéros :

$x =$ aucun

$y = 8$

$\nearrow$: $[3, \infty[$

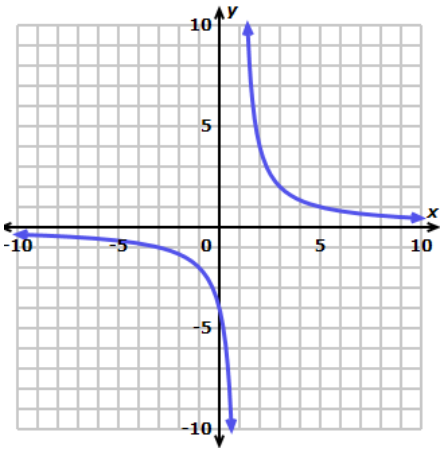
$\searrow$: $]-\infty, 3]$

$+$: $]-\infty, \infty[$

$-$: jamais

Aucune asymptote

c)



$D =]-\infty, 1[\cup]1, \infty[$

$I =]-\infty, 0[\cup]0, \infty[$

zéros :

$x =$ aucun

$y = -4$

$\nearrow$: jamais

$\searrow$: $]-\infty, 1[\cup]1, \infty[$

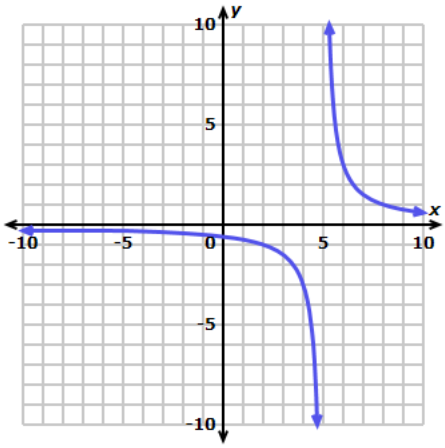
$+$: $]1, \infty[$

$-$: $]-\infty, 1[$

Horizontale : $y = 0$

Verticale : $x = 1$

d)



$D =]-\infty, 5[\cup]5, \infty[$

$I =]-\infty, 0[\cup]0, \infty[$

zéros :

$x =$ aucun

$y = -0,5$

$\nearrow$: jamais

$\searrow$: $]-\infty, 5[\cup]5, \infty[$

$+$: $]5, \infty[$

$-$: $]-\infty, 5[$

Horizontale : $y = 0$

Verticale : $x = 5$

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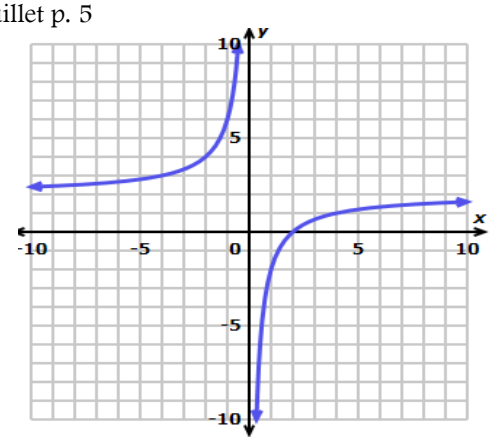
e)



$D =]-\infty, 0[\cup]0, \infty[$

$I =]-\infty, 2[\cup]2, \infty[$

zéros :
$x = 2$
$y =$ aucun

$\nearrow$: $]-\infty, 0[\cup]0, \infty[$

$\searrow$: jamais

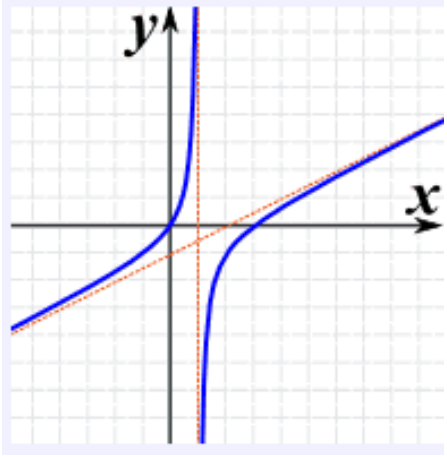
$+$: $]-\infty, 0[\cup [2, \infty[$

$-$: $]0, 2[$

Horizontale : $y = 2$

Verticale : $x = 0$

f)



$D =]-\infty, 1[\cup]1, \infty[$

$I =]-\infty, \infty[$

zéros :
$x = 0$ et 3
$y = 0$

$\nearrow$: $]-\infty, 1[\cup]1, \infty[$

$\searrow$: jamais

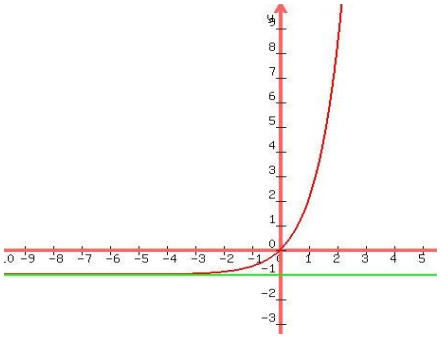
$+$: $]0, 1[\cup]3, \infty[$

$-$: $]-\infty, 0[\cup]1, 3[$

Oblique : $y = \frac{1}{2}x - 1$

Verticale : $x = 1$

g)



$D =]-\infty, \infty[$

$I =]-1, \infty[$

zéros :
$x = 0$
$y = 0$

$\nearrow$: $]-\infty, \infty[$

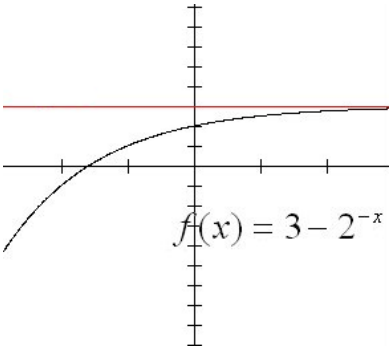
$\searrow$: jamais

$+$: $]0, \infty[$

$-$: $]-\infty, 0[$

Horizontale : $y = -1$

h)



$D =]-\infty, \infty[$

$I =]-\infty, 3[$

zéros :
$x = -1,5$
$y = 2$

$\nearrow$: $]-\infty, \infty[$

$\searrow$: jamais

$+$: $]-1,5, \infty[$

$-$: $]-\infty, 1,5[$

Horizontale : $y = 3$