Math 2^e Ch1 Activité 19 $\boxed{3}$

a) $f(x) = 3x - \frac{5}{7}$

Z_f : $3x - \frac{5}{7} = 0 \quad \big| \cdot 7$

$21x - 5 = 0 \quad \big| +5$

$x = 5/21 \quad \big| \div 21$

$Z_f = \left\{\frac{5}{21}\right\}$

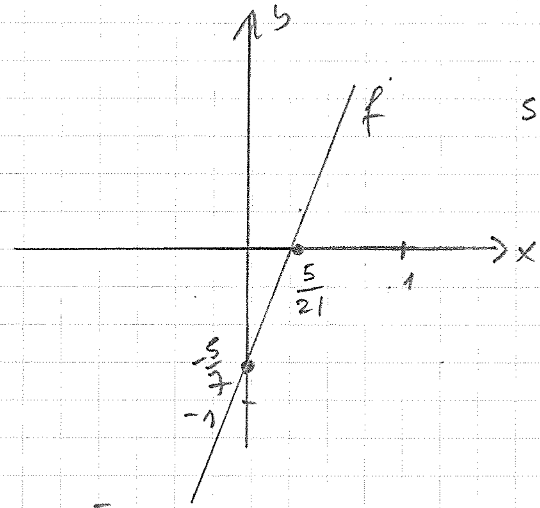


schéma (suffisant, l'information pertinente ici est le zéro)

$f(x) \geq 0 \iff x \in \left[\frac{5}{21} ; +\infty\right[$ $\qquad f \nearrow \iff x \in \mathbb{R}$

$f(x) \leq 0 \iff x \in \left]-\infty ; \frac{5}{21}\right]$ $\qquad f \searrow \iff x \in \emptyset$

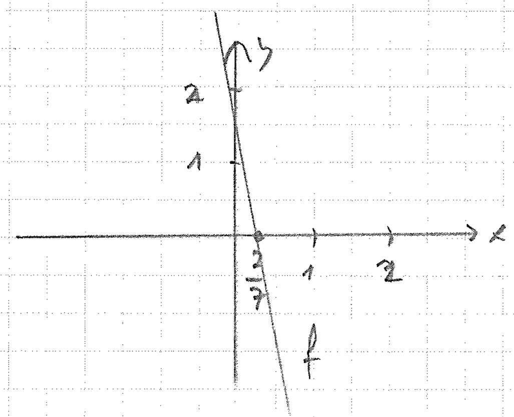
b) $f(x) = 2 - 7x$

Z_f : $2 - 7x = 0$

$2 = 7x$

$x = 2/7$

$Z_f = \left\{\frac{2}{7}\right\}$



$f(x) \geq 0 \iff x \in \left]-\infty ; \frac{2}{7}\right]$ $\qquad f \nearrow \iff x \in \emptyset$

$f(x) \leq 0 \iff x \in \left[\frac{2}{7} ; +\infty\right[$ $\qquad f \searrow \iff x \in \mathbb{R}$

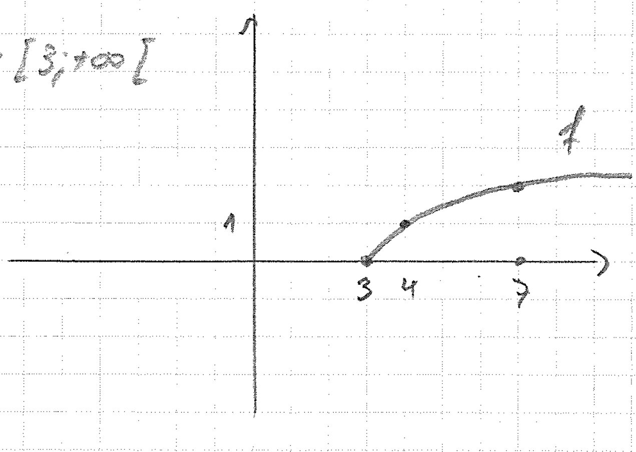
c) $f(x) = \sqrt{x-3}$ $\qquad D_f : [3 ; +\infty[$

Z_f : $\sqrt{x-3} = 0$

$x - 3 = 0$

$x = 3$

$Z_f = \{3\}$



$f(4) = 1$

$f(7) = 2$

$f(x) \geq 0 \iff x \in \mathbb{R}$ $\qquad f \nearrow \iff x \in \mathbb{R}$

$f(x) \leq 0 \iff x \in \{3\}$ $\qquad f \searrow \iff x \in \emptyset$

$[\ f(x) < 0 \iff x \in \emptyset\ ]$

d) $f(x)=\sqrt{12-8x}$

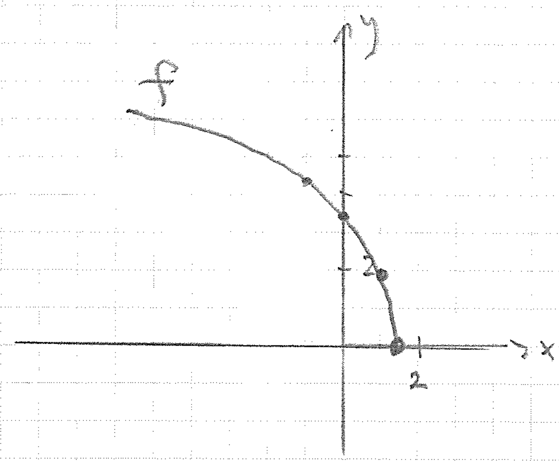
D_f : pb si $12-8x<0$

$12<8x$

$\frac{12}{8}<x$

$\frac{3}{2}<x$

$D_f = \left]-\infty ; \frac{3}{2}\right]$



Z_f : $\sqrt{12-8x}=0$

$12-8x=0$

$12=8x$

$x=\frac{12}{8}=\frac{3}{2}$

$Z_f=\left\{\frac{3}{2}\right\}$

$f(-1)=\sqrt{20}\cong 4,5$

$f(0)=\sqrt{12}\cong 3,5$

$f(1)=2$

$f(x)\geq 0 \Leftrightarrow x\in \left]-\infty ; \frac{3}{2}\right]$

$f(x)\leq 0 \Leftrightarrow x\in \emptyset$

$f \nearrow \Leftrightarrow x\in \emptyset$

$f \searrow \Leftrightarrow x\in \left]-\infty ; \frac{3}{2}\right]$

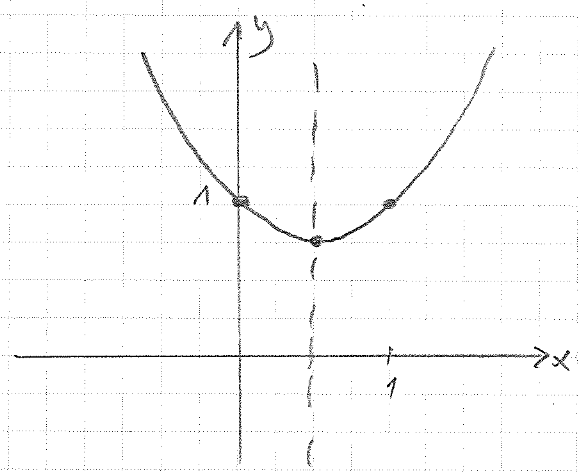
e) $f(x)=x^2-x+1$

Z_f : $\Delta=(-1)^2-4\cdot1\cdot1=-3$

$Z_f=\emptyset$

$S=\left(-\frac{b}{2a} ; -\frac{\Delta}{4a}\right)=\left(\frac{1}{2} ; \frac{3}{4}\right)$

axe : $x=-\frac{b}{2a}=\frac{1}{2}$



$f(0)=1$

pt sym : $f(1)=1$

($f(2)=3$ pas nécessaire pour répondre ...)

$f(x)\geq 0 \Leftrightarrow x\in \mathbb{R}$

$f(x)\leq 0 \Leftrightarrow x\in \emptyset$

$f \nearrow \Leftrightarrow x\in \left[\frac{1}{2} ; +\infty\right[$

$f \searrow \Leftrightarrow x\in \left]-\infty ; \frac{1}{2}\right]$

f) $f(x) = x^2\ 2x - 3$

$= (x-3)(x+1)$

$Z_f = \{-1;3\}$

axe: $x = -\frac{b}{2a} = 1$

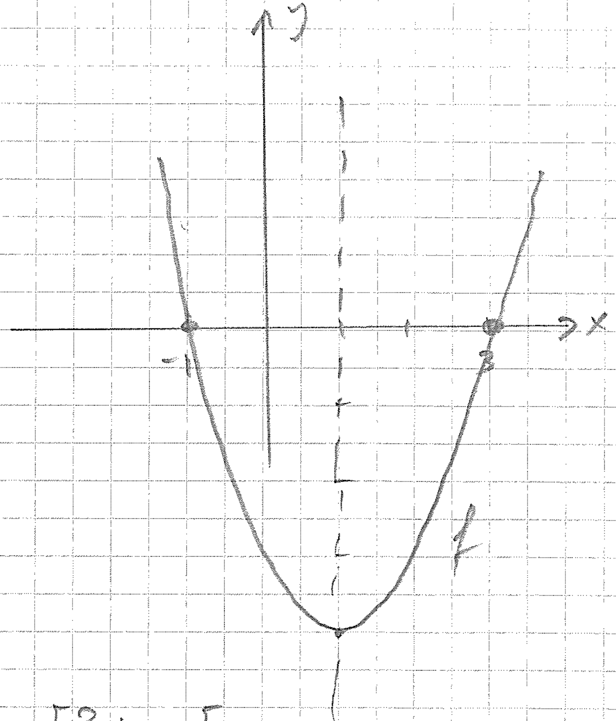
$f(1) = -4 \Rightarrow S(1;-4)$

$f \nearrow \Leftrightarrow x \in [1;+\infty[$

$f \searrow \Leftrightarrow x \in]-\infty;1]$

$f(x) \geq 0 \Leftrightarrow x \in]-\infty;-1] \cup [3;+\infty[$

$f(x) \leq 0 \Leftrightarrow x \in [-1;3]$



g) $f(x) = -6x + 9 + x^2$

$= x^2 - 6x + 9$

$= (x-3)^2$

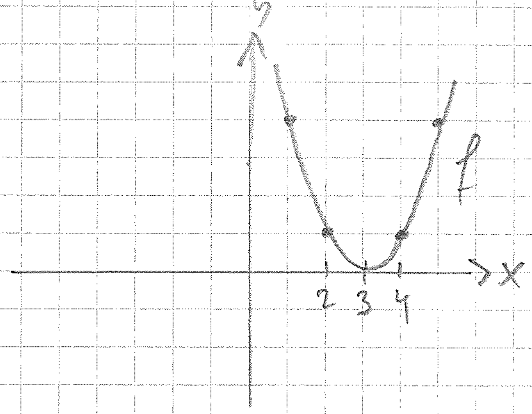
$Z_f = \{3\}$

$f(1) = 4 \ / \ f(5) = 4$

$f(2) = 1 \ / \ f(4) = 1$

$f \nearrow \Leftrightarrow x \in [3;+\infty[$

$f \searrow \Leftrightarrow x \in]-\infty;+3]$



$f(x) \geq 0 \Leftrightarrow x \in \mathbb{R}$

$f(x) \leq 0 \Leftrightarrow x \in \emptyset$

h) $f(x) = -3x^2 + 9 + 6x$

$= -3(x^2 - 2x - 3)$

$= -3(x-3)(x+1)$

$Z_f = \{-1;3\}$

axe: $x = 1$; $f(1) = 12$

$S = (1;12)$

$f(0) = 9 \ / \ f(2) = 9$

$f(x) \geq 0$
$\Leftrightarrow x \in [1;3$

$f(x) \leq 0$
$\Leftrightarrow x \in]-\infty;1$
$\cup [3;+\infty$

$f \nearrow \Leftrightarrow x \in]-\infty;1$

$f \searrow \Leftrightarrow x \in [1;+\infty$