

Exercices du syllabus p32

Etudier la continuité des fonctions suivantes en précisant le type de discontinuité
Schématiser les graphiques (éventuellement dans Geogebra) en amenant les
précisions nécessaires pour illustrer les calculs

$$f_1(x) = \begin{cases} x^2 - 4 & \text{si } x < -1 \\ -3 & \text{si } x = -1 \\ 2x - 1 & \text{si } -1 < x < 2 \\ \frac{1}{x-3} & \text{si } x \geq 2 \end{cases}$$

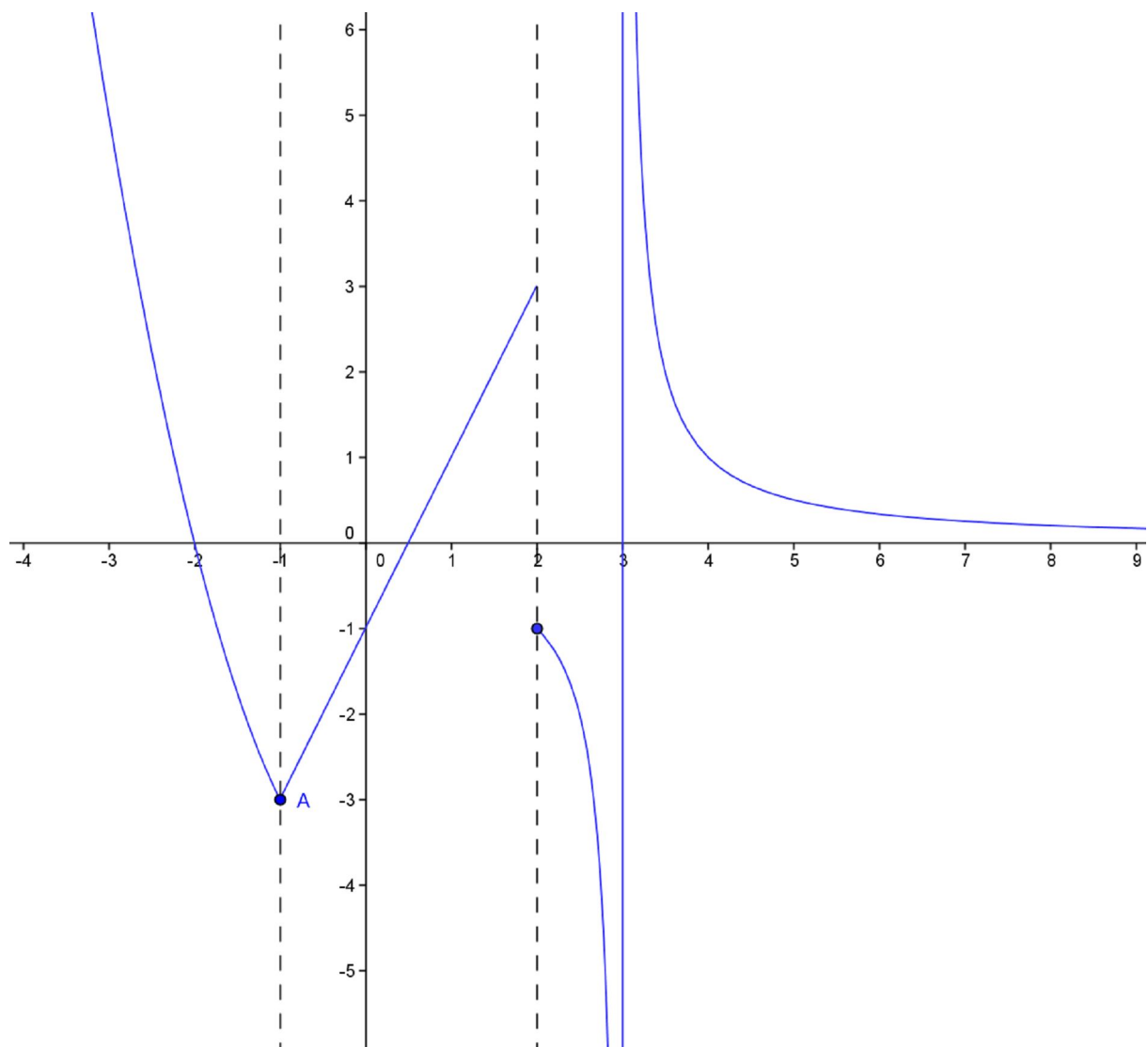
$$f_2(x) = \begin{cases} \sqrt{x-2} & \text{si } x \leq 6 \\ x-4 & \text{si } 6 < x < 8 \\ \frac{1}{\sqrt{x-7}} & \text{si } x \geq 8 \end{cases}$$

$$f_3(x) = \begin{cases} \frac{1}{x+2} & \text{si } x < 0 \\ \sin x & \text{si } 0 \leq x < \frac{3\pi}{4} \\ -\cos x & \text{si } x \geq \frac{3\pi}{4} \end{cases}$$

$$f_4(x) = \begin{cases} \frac{x+3}{x^2-9} & \text{si } x < 4 \\ \frac{7}{2x-1} & \text{si } x \geq 4 \end{cases}$$

$$f_1(x) = \begin{cases} x^2 - 4 & \text{si } x < -1 \\ -3 & \text{si } x = -1 \\ 2x - 1 & \text{si } -1 < x < 2 \\ \frac{1}{x-3} & \text{si } x \geq 2 \end{cases}$$

$$D = \mathbb{R} \setminus \{3\}$$



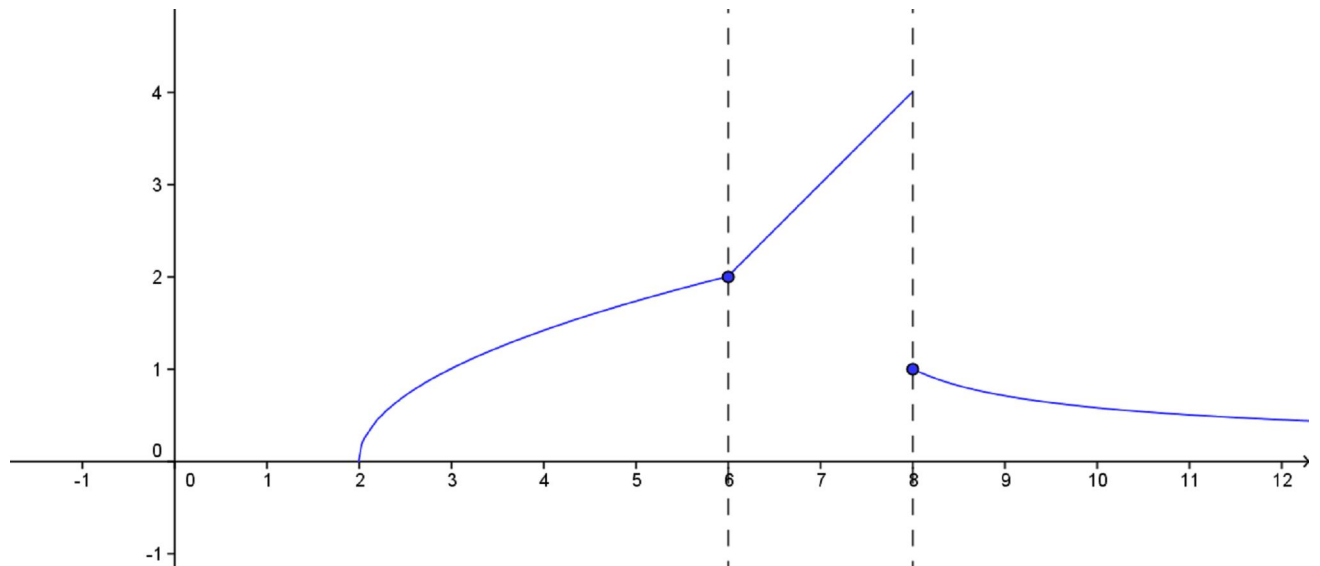
continu en $x = -1$

discontinu en $x = 2$ (saut)

discontinu en $x = 3$ (A.V.)

$$f_2(x) = \begin{cases} \sqrt{x-2} & \text{si } x \leq 6 \\ x-4 & \text{si } 6 < x < 8 \\ \frac{1}{\sqrt{x-7}} & \text{si } x \geq 8 \end{cases}$$

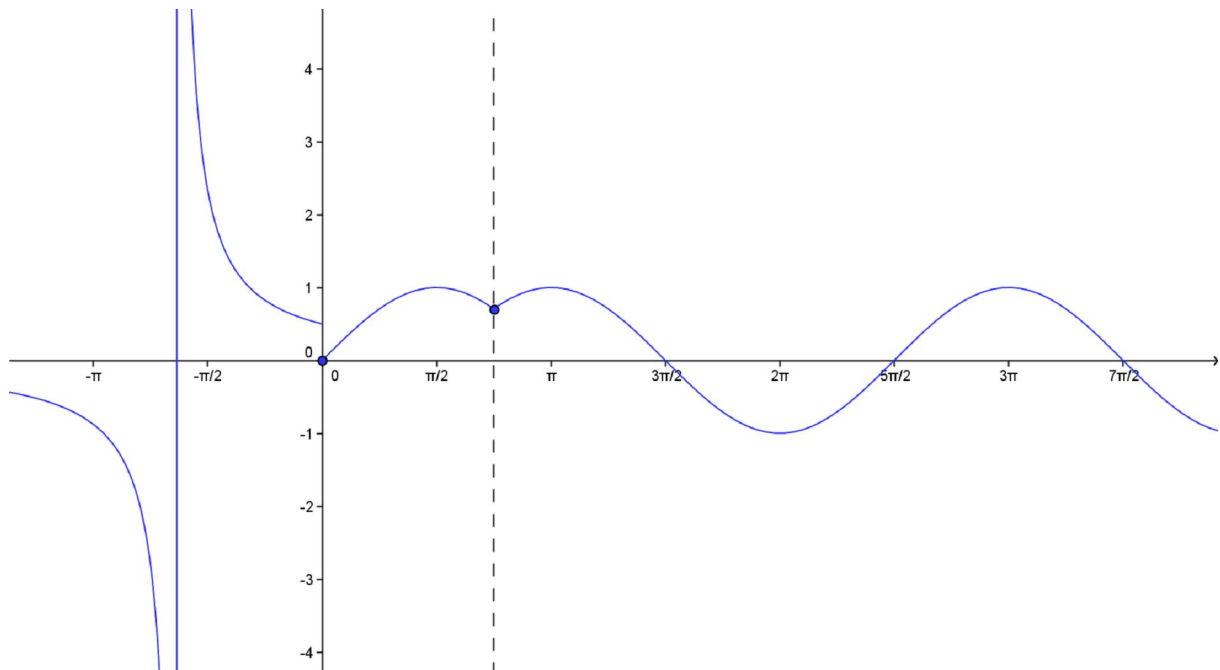
$$D = [2, +\infty[$$



continu à droite en $x = 2$
 continu en $x = 6$
 discontinu en $x = 8$ (saut)

$$f_3(x) = \begin{cases} \frac{1}{x+2} & \text{si } x < 0 \\ \sin x & \text{si } 0 \leq x < \frac{3\pi}{4} \\ -\cos x & \text{si } x \geq \frac{3\pi}{4} \end{cases}$$

$$D =]-\infty, -2[\cup]-2, +\infty[$$



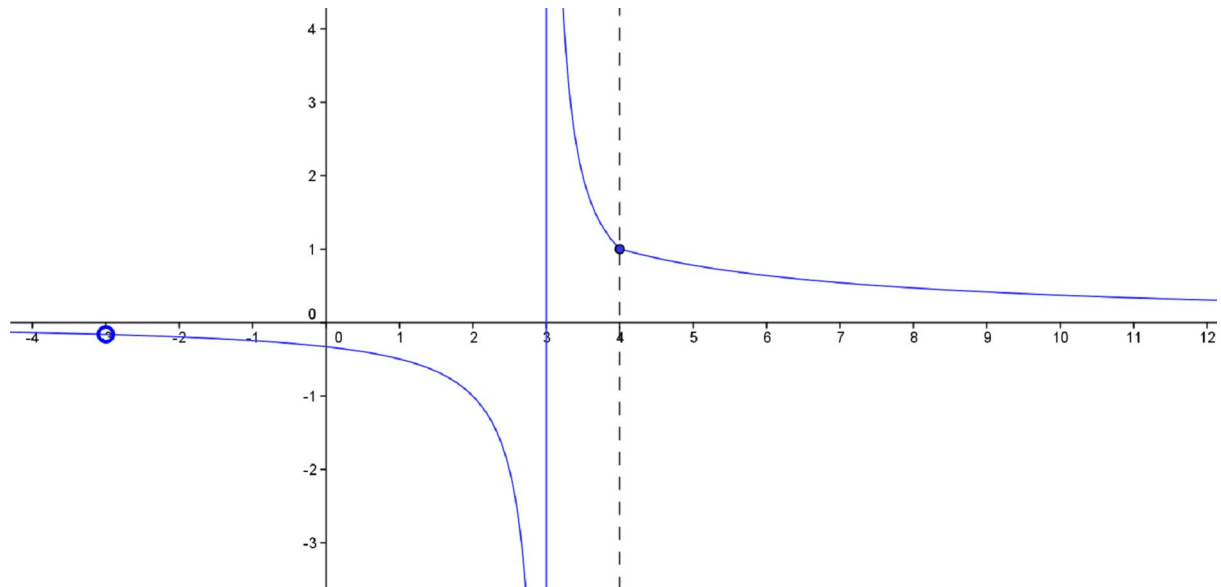
discontinu en $x = -2$ (A.V.)

discontinu en $x = 0$ (saut)

continu en $x = 3\pi/4$

$$f_4(x) = \begin{cases} \frac{x+3}{x^2-9} & \text{si } x < 4 \\ \frac{7}{2x-1} & \text{si } x \geq 4 \end{cases}$$

$$D =]-\infty, -3[\cup]-3, 3[\cup]3, +\infty[= \mathbb{R} \setminus \{-3, 3\}$$



discontinu en $x = -3$ (point manquant)

$g(x) = \frac{1}{x-3}$ est la prolongée continue de $f_4(x)$ en $x = -3$

discontinu en $x = 3$ (A.V.)

continu en $x = 4$