

Cours d'appoint

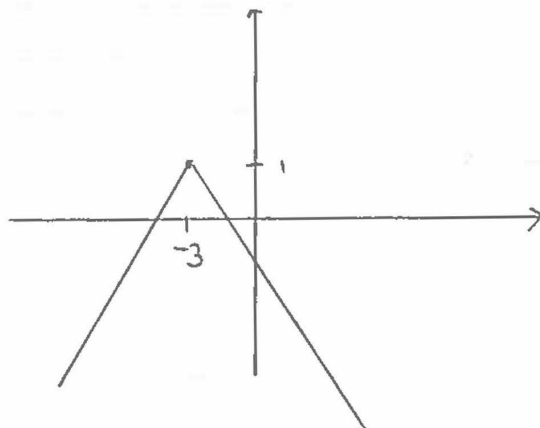
Fonction valeur absolue

Nol $f(x) = -\frac{5}{3} |-3x-9| + 1$

a) Peu importe, le signe de "b" lorsque sorti de la val. abs. il sera toujours \ominus

b) $f(x) = -\frac{5}{3} |-3(x+3)| + 1$
 $= -\frac{5}{3} \cdot 3 |x+3| + 1$
 $= -5|x+3| + 1$

c)



d) $0 = -5|x+3| + 1$

$$-1 = -5|x+3|$$

$$0,2 = |x+3|$$

$\oplus \quad \ominus$

$$x+3 > 0 \quad x+3 < 0$$

$$x > -3$$

$$x < -3$$

$$x+3 = 0,2$$

$$x+3 = -0,2$$

$$x = -2,8$$

$$x = -3,2$$

e) $-5|x+3| + 1 = x - 1$

$$-5|x+3| = x - 2$$

$$|x+3| = \frac{x-2}{-5}$$

$$|x+3| = -0,2x + 0,4$$

$\oplus \quad \ominus$

$$x > -3$$

$$x < -3$$

$$x+3 = -0,2x + 0,4 \quad \left| \quad x+3 = 0,2x - 0,4 \right.$$

$$x = -0,2x - 2,6$$

$$x = 0,2x - 3,4$$

$$1,2x = -2,6$$

$$0,8x = -3,4$$

$$x = -2,1\bar{6}$$

$$x = -4,25$$

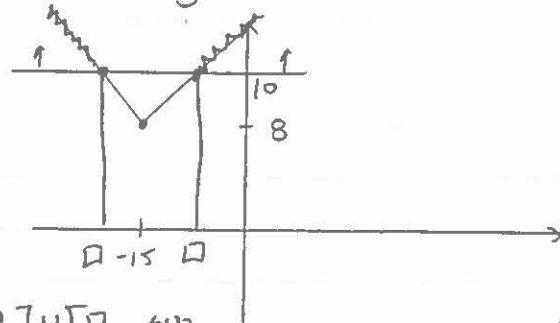
ou

ou

No 2 $f(x) = \frac{1}{6} | -2(x+15) | + 8$

$f(x) = \frac{1}{3} | x+15 | + 8$

Esquisse



$-\infty, \square] \cup [\square, +\infty$

$10 = \frac{1}{3} | x+15 | + 8$

$2 = \frac{1}{3} | x+15 |$

$6 = | x+15 |$

$\begin{matrix} \oplus & \ominus \\ x+15 > 0 & x+15 < 0 \end{matrix}$

$x > -15$

$x < -15$

$x+15 = 6$

$x+15 = -6$

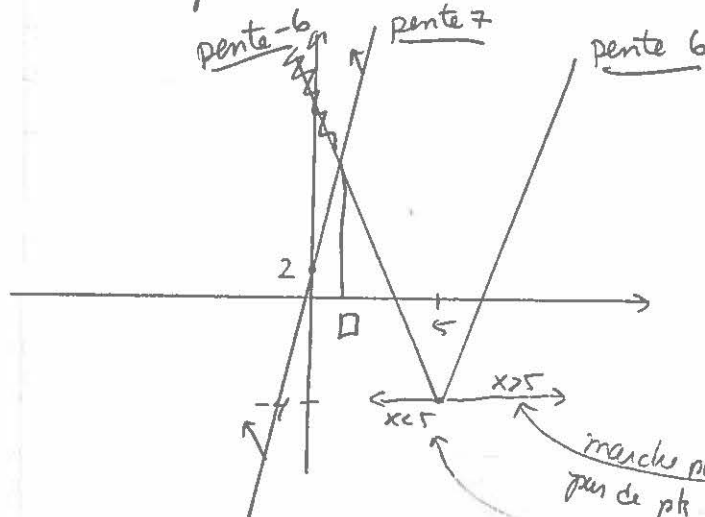
$x = -9$

$x = -21$

$-\infty, -21] \cup [-9, +\infty$

No 3 $f(x) = 2 | 15-3x | - 4$
 $= 2 | -3x+15 | - 4$
 $= \frac{2}{3} | (-3)(x-5) | - 4$

$f(x) = 6 | x-5 | - 4$



$-\infty, \square]$

$-\infty, 1,85]$

$g(x) = 7x+2$

$6 | x-5 | - 4 = 7x+2$

$6 | x-5 | = 7x+6$

$| x-5 | = \frac{7x+6}{6}$

$| x-5 | = 1,1\bar{6}x+1$

$\begin{matrix} \oplus & \ominus \\ x > 5 & x < 5 \end{matrix}$

marche pas car pas de pt d'intersec. marchera...

$x-5 = 1,1\bar{6}x+1$

$x = 1,1\bar{6}x+6$

$-0,1\bar{6}x = 6$

$x = -36$

non

$x-5 = -1,1\bar{6}x-1$

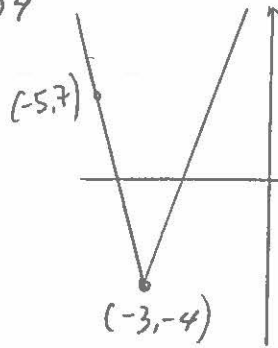
$x = -1,1\bar{6}x+4$

$2,1\bar{6}x = 4$

$x = 1,85$

oui

Nb 4



$$y = a|x-h|+k$$

$$y = a|x+3|-4$$

$$(-5,7) \rightarrow 7 = a|-5+3|-4$$

$$7 = a|-2|-4$$

$$7 = a(2) - 4$$

$$11 = a(2)$$

$$5,5 = a$$

$$\underline{\underline{y = 5,5|x+3|-4}}$$

Nb 5.

$$f(x) = -4|3-x|+5$$

$$= -4|-x+3|+5$$

$$= \cancel{(-4)} \cdot (-1)(x-3) + 5$$

$$f(x) = -4|x-3|+5$$

$$-4|x-3|+5 = -2x+1$$

$$-4|x-3| = -2x-4$$

$$|x-3| = \frac{-2x-4}{-4}$$

$$|x-3| = 0,5x+1$$

$$\begin{matrix} \oplus & \ominus \\ x > 3 & x < 3 \end{matrix}$$

$$x-3 = 0,5x+1$$

$$x = 0,5x+4$$

$$0,5x = 4$$

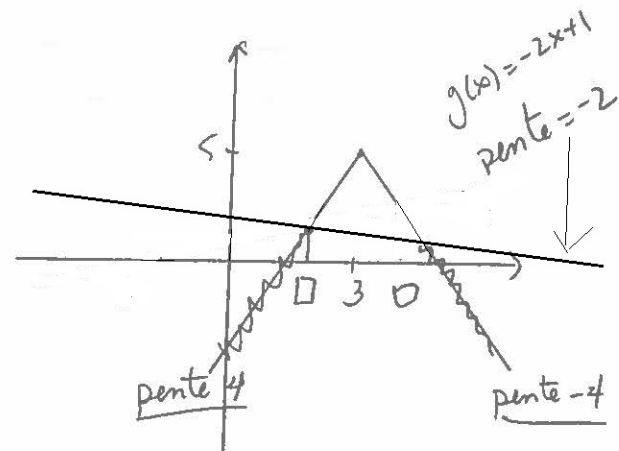
$$\boxed{x=8}$$

$$x-3 = -0,5x-1$$

$$x = -0,5x+2$$

$$1,5x = 2$$

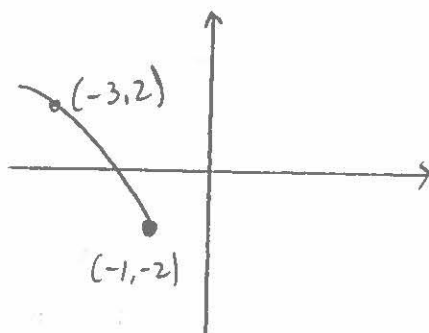
$$\boxed{x=1,3}$$



$$-\infty, \square [0] \square, +\infty$$

$$\boxed{-\infty, 1,3 [0] 8, +\infty}$$

Nb 6



$$y = a\sqrt{b(x-h)}+k \quad h=-1$$

$$k=-2$$

$$b=-1 \text{ car } \underline{\text{ouvert}}$$

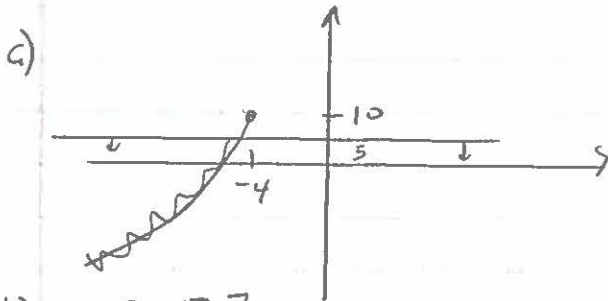
$$(-3,2) \rightarrow 2 = a\sqrt{-1(-3+1)} - 2$$

$$\frac{4}{\sqrt{2}} = \frac{a\sqrt{2}}{\sqrt{2}}$$

$$2,83 = a$$

$$\underline{\underline{y = 2,83\sqrt{-1(x+1)} - 2}}$$

No 7 $f(x) = -5\sqrt{-4x-16} + 10$
 $= -5\sqrt{-4(x+4)} + 10$



b) $-\infty, \square]$

$$5 = -5\sqrt{-4x-16} + 10$$

$$-5 = -5\sqrt{-4x-16}$$

$$1 = \sqrt{-4x-16}$$

$$1 = -4x - 16$$

$$17 = -4x$$

$$\underline{-4,25 = x}$$

$$-4x - 16 \geq 0$$

$$-4x \geq 16$$

$$\frac{-4x}{-4} \geq \frac{16}{-4}$$

$$\boxed{x \leq -4}$$

rip: $-\infty, -4,25]$

c) $x = -5\sqrt{-4y-16} + 10$

$$x - 10 = -5\sqrt{-4y-16}$$

$$\frac{x-10}{-5} = \sqrt{-4y-16}$$

$$\left(\frac{x-10}{-5}\right)^2 = -4y - 16$$

$$\frac{(x-10)^2}{25} + 16 = \frac{-4y}{-4}$$

$$\boxed{\frac{(x-10)^2}{-100} - 4 = y}$$

au carré

$$\frac{x-10}{-5} \geq 0$$

$$x - 10 \leq 0$$

$$\boxed{x \leq 10}$$

$$-4y - 16 \geq 0$$

$$\frac{-4y}{-4} \geq \frac{16}{-4}$$

$$\boxed{y \leq 4}$$

No 8

$$2\sqrt{-x+7} + 8 = 4x+9$$

$$\frac{2\sqrt{-x+7}}{2} = \frac{4x+1}{2}$$

$$\sqrt{-x+7} = 2x+0,5$$

aux carrés $\rightarrow -x+7 = 4x^2 + 2x + 0,25$

$$0 = 4x^2 + 3x - 6,75$$

$$\frac{-3 \pm \sqrt{9 - 4(4)(-6,75)}}{8}$$

$$\frac{-3 \pm \sqrt{117}}{8}$$

$\oplus x = 0,98$
 $\ominus x = -1,73$

$-x+7 \geq 0 \rightarrow -x \geq -7 \rightarrow x \leq 7$
 $2x+0,5 \geq 0 \rightarrow 2x \geq -0,5 \rightarrow x \geq -0,25$

$(2x+0,5)(2x+0,5)$

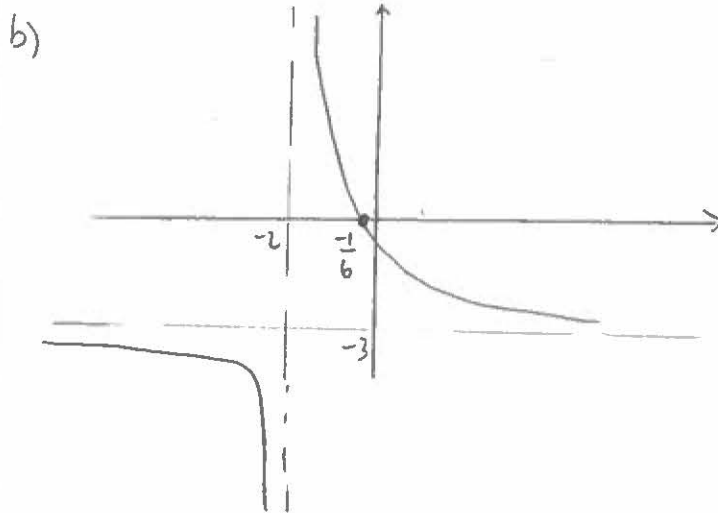
No 9 $f(x) = \frac{-6x-1}{2x+4}$

a) $\frac{-6x-1}{11} \mid \frac{2x+4}{-3}$

$$y = \frac{11}{2x+4} - 3$$

$$y = \frac{11}{2(x+2)} - 3$$

$$y = \frac{5,5}{x+2} - 3$$



c) $0 = \frac{-6x-1}{2x+4} \cdot \frac{2x+4}{2x+4}$

$$0 = -6x-1$$

$$\frac{-1}{6} = x$$

d) $f(x) > 0 \quad]-2, -\frac{1}{6}[$

e) $f(x) < 0 \quad -\infty, -2[\cup]-\frac{1}{6}, +\infty$

h) $x = -2 \quad y = -3$

i) $\lim_{x \rightarrow +\infty} \frac{5,5}{x+2} - 3 = \frac{5,5}{+\infty} - 3 = -3$

f) $\text{dom } f: \mathbb{R} \setminus \{-2\}$

g) $\text{Imag } f: \mathbb{R} \setminus \{-3\}$

No 10 $f(x) = 2x-1$ $g(x) = |x-3|$

a) $(f \circ g)(x) = f(g(x)) = 2|x-3| - 1$

b) $(g \circ f)(x) = g(f(x)) = |2x-1-3| = |2x-4|$

No 11

$$f(x) = \frac{100x+150}{x+2}$$

Si $x \rightarrow +\infty$ heures $y = \frac{100(+\infty)+150}{+\infty+2} = \frac{+\infty}{+\infty}$ indéterminé.
impossible

$$\begin{array}{r} 100x+150 \\ \hline 100x+200 \\ \hline -50 \end{array} \quad \begin{array}{r} |x+2 \\ \hline 100 \end{array}$$

$$y = \frac{-50}{x+2} + 100$$

Si $x \rightarrow +\infty$ heures $y = \frac{-50}{+\infty+2} + 100$

$$= \frac{-50}{+\infty} + 100$$

$$= 0 + 100 = \underline{\underline{100^\circ\text{C}}}$$

Nb 12

Rationaliser : CONJUGUE!

$$a) \frac{-5}{3-\sqrt{x}} \cdot \frac{3+\sqrt{x}}{3+\sqrt{x}} = \frac{-15-5\sqrt{x}}{9+3\sqrt{x}-3\sqrt{x}-x} = \boxed{\frac{-15-5\sqrt{x}}{9-x}}$$

$$b) \frac{4}{2\sqrt{x}+1} \cdot \frac{2\sqrt{x}-1}{2\sqrt{x}-1} = \frac{8\sqrt{x}-4}{4x-2\sqrt{x}+2\sqrt{x}-1} = \boxed{\frac{8\sqrt{x}-4}{4x-1}}$$

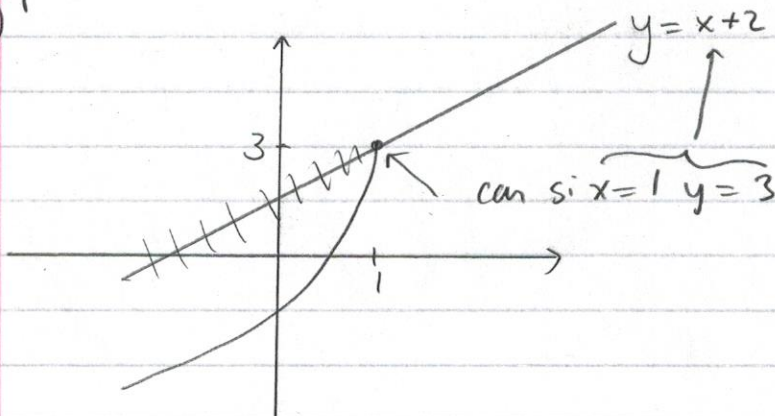
#13 No 13 $f(x) = \begin{cases} -\sqrt{-(x-1)}+3 & \text{si } x \leq 1 \\ x+2 & \text{si } x > 1 \end{cases}$

a) $f(1) = -\sqrt{-(1-1)}+3 = 3$

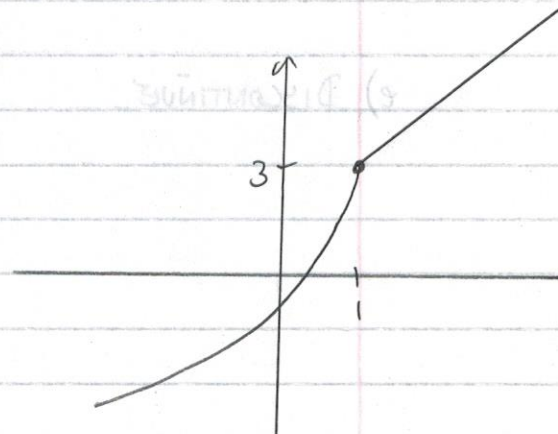
b) $f(0) = -\sqrt{-(0-1)}+3 = 2$

c) $f(4) = 4+2 = 6$

d)



EBAUCHE



FINAL

e) CONTINUE.

NO 14

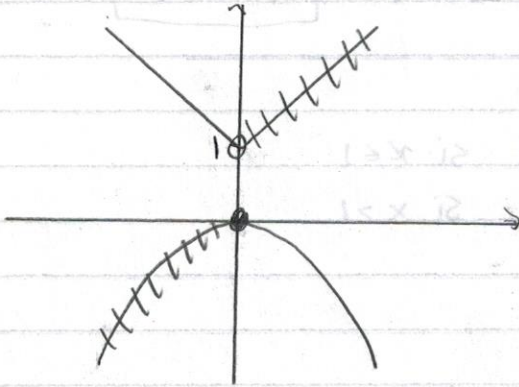
$$f(x) = \begin{cases} -x^2 & \text{si } x \geq 0 \\ 2|x|+1 & \text{si } x < 0 \end{cases}$$

a) $f(0) = -0^2 = 0$

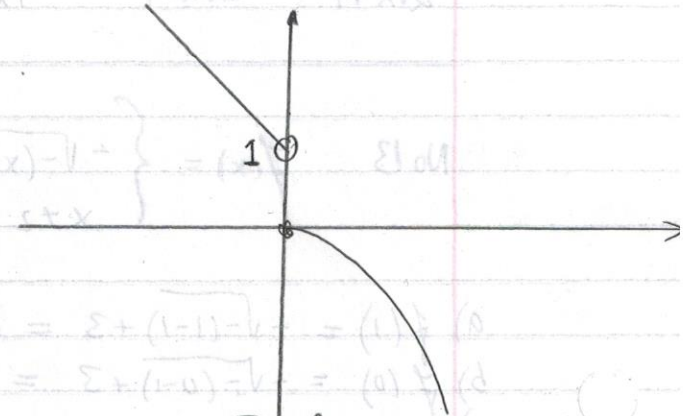
b) $f(-3) = 2|-3|+1 = 7$

c) $f(2) = -2^2 = -4$

d)

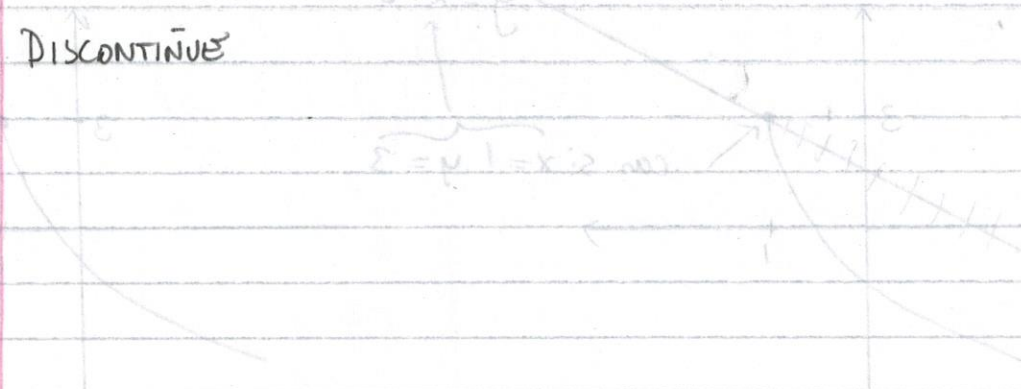


EBAUCHE



FINAL

e) DISCONTINUE



FINAL

EBAUCHE

e) CONTINUE

No 15

1) Si $\text{Ima } f = -\infty, 6] \Rightarrow k=6$

2) Si $h=1 : f(x) = a|x-1|+6 : (-2, -3)$

$$\left. \begin{array}{l} -3 = a|-2-1|+6 \\ -3 = 3a+6 \\ -9 = 3a \\ -3 = a \end{array} \right\} f(x) = -3|x-1|+6$$

3) $g(x) = \frac{7x+78}{x+10}$ $h=?$ $k=?$ (pt de rencontre des asymptotes)

$$\frac{7x+78}{x+10} \begin{array}{l} |x+10 \\ 7 \end{array} \quad h(x) = \frac{8}{x+10} + 7 \quad h=-10 \quad k=7$$

4) h passe par $(-10, 7)$ et zéro de $f : (-1, 0)$

$$\begin{aligned} 0 &= -3|x-1|+6 \\ -6 &= -3|x-1| \\ 2 &= |x-1| \end{aligned}$$

$x \geq 1 \quad \oplus \quad x < 1$

$$\begin{array}{ll} x-1=2 & x-1=-2 \\ x=3 & \underline{\underline{x=-1}} \end{array}$$

5) $h(x) = a\sqrt{b(x-h)}+k$

$$\left. \begin{array}{l} h(x) = a\sqrt{-1(x+1)}+0 \\ 7 = a\sqrt{-1(-10+1)} : (-10, 7) \\ 7 = a\sqrt{9} \\ 7 = 3a \\ \underline{\underline{7/3 = a}} \end{array} \right\} h(x) = \frac{7}{3}\sqrt{-1(x+1)}$$

6) $h(-17) = \frac{7}{3}\sqrt{-1(-17+1)} = \frac{7}{3}\sqrt{-1 \cdot -16} = \frac{7}{3}\sqrt{16} = \frac{7}{3} \cdot 4 = \frac{28}{3} = \underline{\underline{9,3}}$