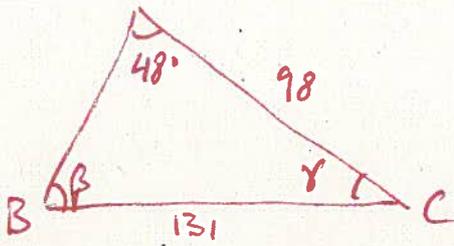


ex 1] a)



• CCA: Δ 2 s/s possibles

• then cosinus:

$$a^2 = b^2 + c^2 - 2bc \cos(\alpha)$$

$$131^2 = 98^2 + c^2 - 2 \cdot 98 \cdot c \cdot \cos(48)$$

$$c^2 - 196 \cos(48)c + (98^2 - 131^2) = 0$$

$$\Delta = [196 \cos(48)]^2 - 4 \cdot (98^2 - 131^2)$$

$$\approx 47428,217 \dots \Rightarrow \text{MEM CALC}$$

$$\sqrt{\Delta} \approx 217,78 \Rightarrow \text{MEM CALC}$$

$$c_{1,2} = \frac{196 \cos(48) \pm \sqrt{\Delta}}{2}$$

$$c_1 \approx 174,5 \text{ ou } c_2 \approx -43,3$$

impossible

• then cosinus:

$$\cos \beta = \frac{a^2 + c^2 - b^2}{2ac} \approx \frac{131^2 + (174,5)^2 - 98^2}{2 \cdot 131 \cdot 174,5}$$

$$\approx 0,83132 \dots \Rightarrow \text{MEM CALC}$$

$$\beta = \cos^{-1}(\dots)$$

$$\approx 33,8^\circ$$

$$\cdot \gamma = 180 - \alpha - \beta \approx 98,2^\circ$$

b) $D = \mathbb{R} \setminus \{\pm 1\}$

$$\frac{3x}{x-1} + 2x - \frac{2x^3+4}{(x-1)(x+1)} = 0$$

$$\Leftrightarrow \frac{3x(x+1) + 2x(x-1)(x+1) - (2x^3+4)}{(x-1)(x+1)} = 0$$

$$\Leftrightarrow \frac{3x^2+3x + 2x^3 - 2x - 2x^3 - 4}{(x-1)(x+1)} = 0 \quad \downarrow (x-1) \cdot (x+1)$$

$$\Leftrightarrow 3x^2 + x - 4 = 0$$

$$\Leftrightarrow (3x+4)(x-1) = 0$$

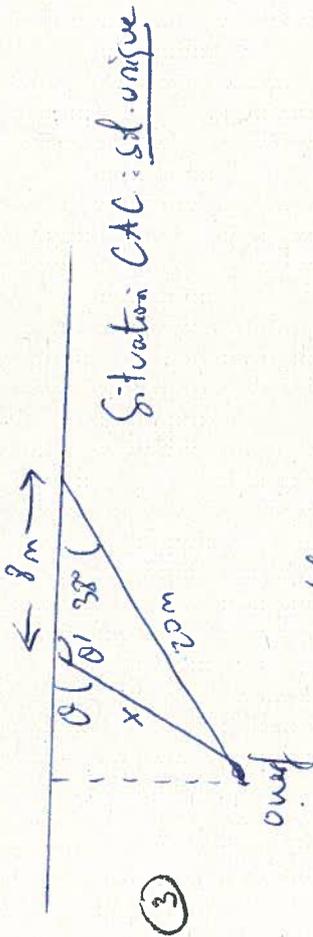
$$x = -\frac{4}{3} \text{ ou } x = 1$$

(5)

$$S = \left\{ -\frac{4}{3} \right\}$$

(1)

ex 2a) Interpretation 1



(3)

- then cosinus:

$$x^2 = 20^2 + 8^2 - 2 \cdot 20 \cdot 8 \cdot \cos(38)$$

$$\approx 211,84 \Rightarrow \text{même calc.}$$

$$\Rightarrow x \approx 14,55 \Rightarrow \text{même calc.}$$

then sinus:

$$\frac{\sin(\theta')}{20} = \frac{\sin(38)}{x}$$

$$\Leftrightarrow \sin(\theta') = \frac{20 \sin(38)}{x}$$

$$\theta' = \sin^{-1}\left(\frac{20 \sin(38)}{x}\right)$$

$$\theta' \approx 57,78^\circ \text{ ou } 122,22^\circ$$

Δ 2 sol possible

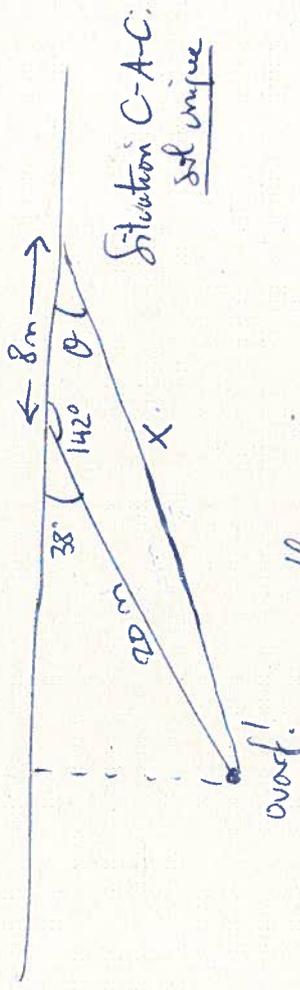
↳ schéma nous montre qu'on doit garder

$$\theta' = 122,22^\circ$$

$$\text{d'où } \theta \approx 57,78^\circ$$

(3)

Interpretation 2



- then cosinus:

$$x^2 = 20^2 + 8^2 - 2 \cdot 8 \cdot 20 \cdot \cos(142)$$

$$\approx 746,16 \text{ m} \Rightarrow \text{même calc.}$$

$$\Rightarrow x \approx 27,32 \text{ m} \Rightarrow \text{même calc.}$$

- then sinus:

$$\frac{\sin(\theta)}{20} = \frac{\sin(142)}{x}$$

$$\Leftrightarrow \sin(\theta) = \frac{20 \sin(142)}{x}$$

$$\Leftrightarrow \theta = \sin^{-1}\left(\frac{20 \sin(142)}{x}\right)$$

$$\theta \approx 27,39^\circ$$

$$2b) \frac{10 \text{ m}}{12} = \frac{10 \text{ m}}{60} = \frac{x \text{ m}}{y} \Leftrightarrow y = \frac{x \cdot 60}{10}$$

dans la 1^{re} interpretation: $y \approx 87,3 \text{ [min]}$

dans la 2^e " : $y \approx 160,6 \text{ [min]}$

(2)

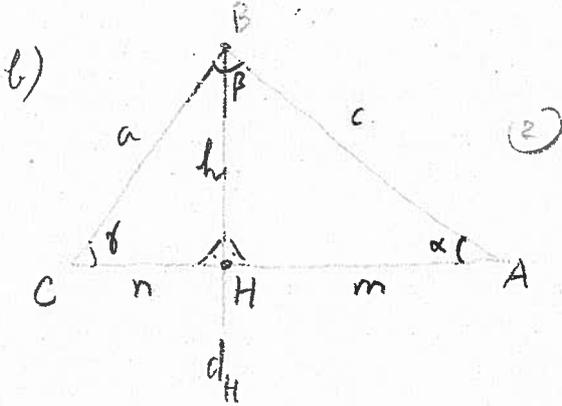
[40] Ex 3
a)

HYP } Si $\triangle ABC$ est un triangle quelconque (voir schéma)

CONCL { alors

$$\begin{aligned} a^2 &= b^2 + c^2 - 2bc \cos(\alpha) \\ b^2 &= a^2 + c^2 - 2ac \cos(\beta) \\ c^2 &= a^2 + b^2 - 2ab \cos(\gamma) \end{aligned}$$

142



c)

$c^2 = h^2 + m^2$, car [ARG *thm Pythagore*]
 1:

$a^2 = h^2 + [n^2]$, car [ARG *thm Pythagore*]
 2:

donc $a^2 - c^2 = n^2 - [m^2]$, car [ARG
 3:]
 $a^2 - c^2 = (h^2 + n^2) - (h^2 + m^2)$
 $= n^2 - m^2$
 cf. Arg 1 et 2

$= (n+m)[n-m]$, car [ARG *3e id. rem.*]
 4:

$= b(b - 2m)$, car [ARG *n = b - m*]
 5:

(6)

$= b^2 - [2bm]$, car [ARG *distributivité*]
 6:

$= b^2 - 2bc \cos(\alpha) c$, car [ARG *cos(α) = m/c* par déf cos. ds tr. rectangle
 7:] d'où $m = c \cdot \cos(\alpha)$

C'est-à-dire : $a^2 = c^2 + b^2 - 2bc \cos(\alpha) c$, car [ARG *+ c^2 des 2 côtés de l'équation*]
 8:

Par permutation circulaire, nous obtenons les deux autres relations à démontrer.

ecu
 $f(x) = \frac{-3(x^2 - 9x - 10)x^3}{(x^2 + x - 4)(x+3)^2(-x+6)} = \frac{-3(x-10)(x+3)x^3}{(-x^2+x-4)(x+3)^2(-x+6)}$
 [1/15]

a) D_f : rpb de $(-x^2+x-4)(x+3)^2(-x+6) = 0$
 $\Delta < 0$ $x = -3$ $x = 6$
 $D_f = \mathbb{R} \setminus \{-3; 6\}$ (3)

Z_f : $f(x) = 0 \Leftrightarrow -3(x^2 - 9x - 10)x^3 = 0$ (et $x \in D_f$)
 $-3(x-10)(x+3)x^3 = 0$
 $x = -1$ ou $x = 10$ ou $x = 0$
 $Z_f = \{-1; 0; 10\}$ (2)

x		-3	-1	0	6	10
-3	-	-	-	-	-	-
$x^2 - 9x + 10$	+	+	+	0	-	-
x^3	-	-	-	-	0	+
$-x^2 + x - 4$	-	-	-	-	-	-
$(x+3)^2$	+	0	+	+	+	+
$-x+6$	+	+	+	+	+	0
$f(x)$	-	///	-	0	+	0

(3)

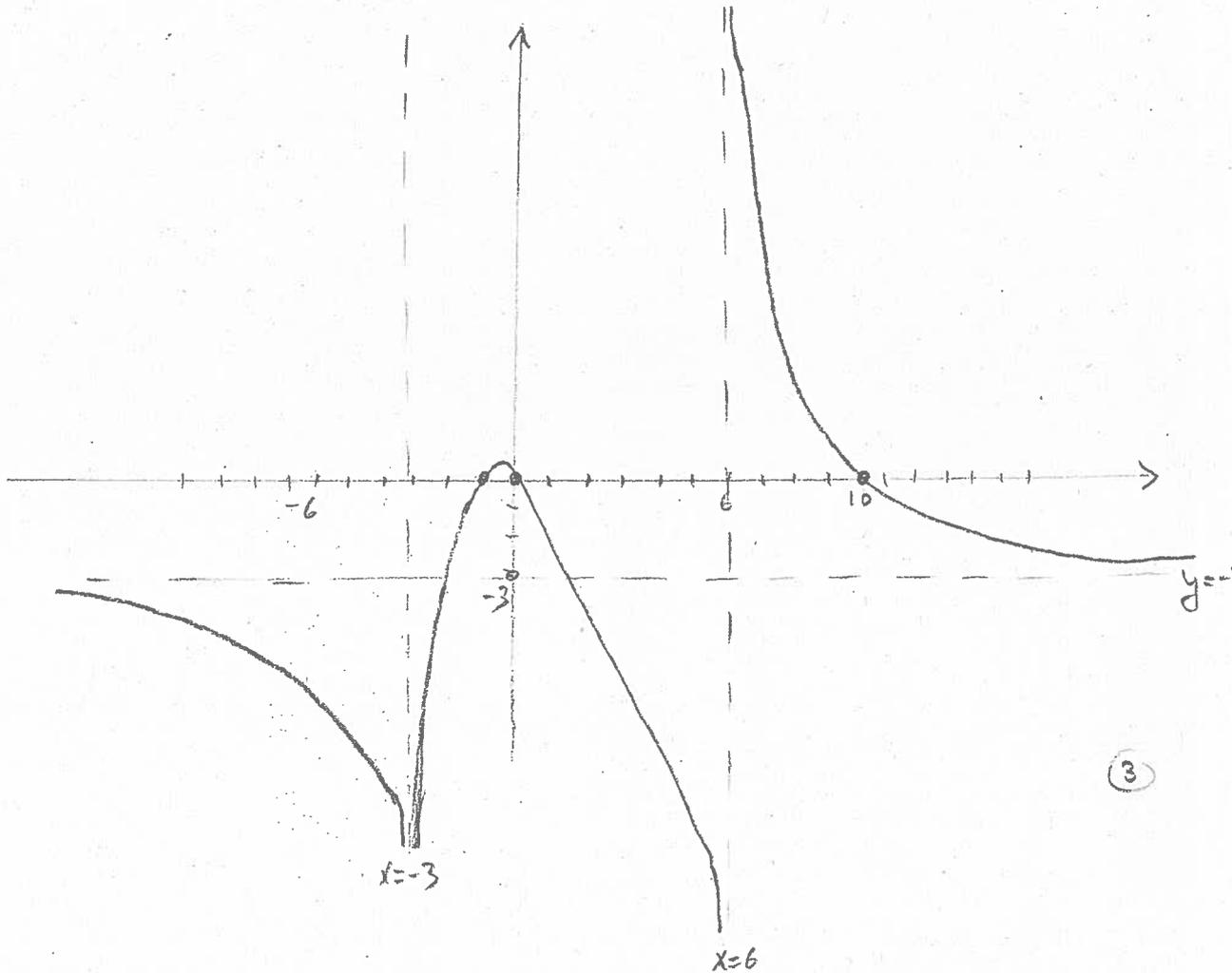
b) as verticals: $x = -3$
 $x = 6$ } cf. table de signes

(2)

as horizontal: $f(x) = \frac{-3x^5 + \dots}{x^5 + \dots}$ donc $y = \frac{-3}{1} = -3$ as horizontal

(2)

c)



(3)

ex 5

$$f(x) = \frac{-x^3 + a}{3(x+3) \cdot x \cdot (x-4)} \quad (2)$$

(2)

$$f(4) = 10 \Leftrightarrow \frac{-1 + a}{3 \cdot 4 \cdot 1 \cdot (-3)} = 10 \Leftrightarrow \frac{-1 + a}{-36} = 10 \Leftrightarrow -1 + a = -360$$

$$\Leftrightarrow a = -359 \quad (2)$$

$$f(x) = \frac{-x^3 - 359}{3x(x+3)(x-4)}$$