Méchants bons problèmes Fts EXPONENTIELLES ET LOGARITHMIQUES

#1 a) $6 \xrightarrow{\times 3} 18, 54, 162, \underline{486}, \underline{1458}, \underline{4374}$ (RAISON ou facteur multiplicatif est 3)

b) $2916 \xrightarrow{\times \frac{1}{9}} 324, 36, \underline{4}, \underline{\frac{4}{9}}, \frac{4}{81}$ (RAISON ou facteur multiplicatif est $\frac{1}{9}$)

#2 a) $13 \xrightarrow{\times 5} \underline{65} \xrightarrow{\times 5} \underline{325}, 1625$: Valeur du n^e terme $= V.i\,(\text{RAISON})^{n-1}$

$$1625 = 13 \cdot c^3$$
$$125 = c^3$$
$$\sqrt[3]{125} = c$$
$$5 = c$$

b) $4 \xrightarrow{\times 9} \underline{36}, 324, \underline{2916}, 26244$

$$324 = 4 \cdot c^2$$
$$81 = c^2$$
$$9 = c$$

c) $3{,}5 \xrightarrow{\times 4} \underline{14}, 56, \underline{224}, 896$

$$56 = 3{,}5 \cdot c^2$$
$$16 = c^2$$
$$4 = c$$

#3 a)
$$\left(\frac{3^2 \cdot 9}{243}\right)^{-3} = \left(\frac{3^2 \cdot 3^2}{3^5}\right)^{-3} = \frac{3^{-6} \cdot 3^{-6}}{3^{-15}} = \frac{3^{-12}}{3^{-15}} = 3^{-12-{-15}} = 3^3$$

b)
$$\frac{49^2 \cdot 343^{-2}}{\sqrt{2401^{-1}}} = \frac{(7^2)^2 \cdot (7^3)^{-2}}{(2401^{1/2})^{-1}} = \frac{7^4 \cdot 7^{-6}}{((7^4)^{1/2})^{-1}} = \frac{7^{-2}}{7^{-2}} = 7^0 = 1$$

c)
$$\sqrt{\frac{2^{-2}}{16^{-1}}} = \left(\frac{2^{-2}}{(2^4)^{-1}}\right)^{1/2} = \left(\frac{2^{-2}}{2^{-4}}\right)^{1/2} = \frac{2^{-1}}{2^{-2}} = 2^{-1-{-2}} = 2^1 = 2$$

#4 a) oui b) NON c) NON d) oui e) NON

#5 a) $3^4 = 81 \Rightarrow 4 = \log_3 81$

b) $144^{1/2} = 12 \Rightarrow \frac{1}{2} = \log_{144} 12$

c) $\left(\frac{1}{3}\right)^{-2} = 9 \Rightarrow -2 = \log_{\frac{1}{3}} 9$

#6 a) $\log_2 16 = 4 \Rightarrow 2^4 = 16$

b) $\log_5 1 = 0 \Rightarrow 5^0 = 1$

c) $\log 1000 = 3 \Rightarrow 10^3 = 1000$

#7 a) $\log_5 25 = ? \Rightarrow 5^? = 25$ $\quad \underline{? = 2}$

b) $\log_3 \frac{1}{81} = ? \Rightarrow 3^? = \frac{1}{81}$ $\quad \underline{? = -4}$

c) $\log_{\frac{1}{2}} 8 = ? \Rightarrow \left(\frac{1}{2}\right)^? = 8$ $\quad \underline{? = -3}$

#8 a) $y = -2\left(\frac{1}{3}\right)^{-3x+12} - 5$

$y = -2\left(\frac{1}{3}\right)^{-3(x-4)} - 5$

$y = -2 \cdot 27^{x-4} - 5$

b) $y = 7\left(\frac{1}{2}\right)^{2x+6} + 1$

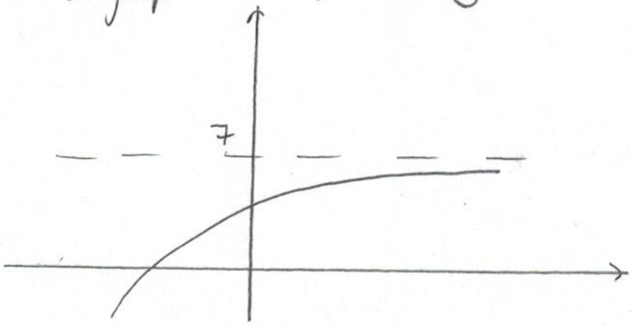
$y = 7\left(\frac{1}{2}\right)^{2(x+3)} + 1$

$y = 7\left(\frac{1}{4}\right)^{x+3} + 1$

#9 a) $y = -3 \cdot 10^{-2x+10} + 7$ asymptote horizontale $y = 7$

b) $y = -3 \cdot 10^{-2(x-5)} + 7$

$y = -3 \cdot \left(\frac{1}{100}\right)^{x-5} + 7$



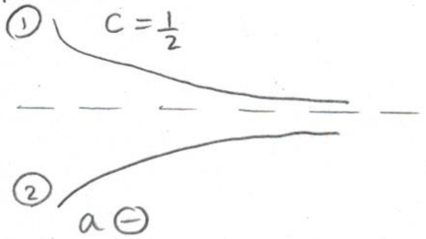
Allure

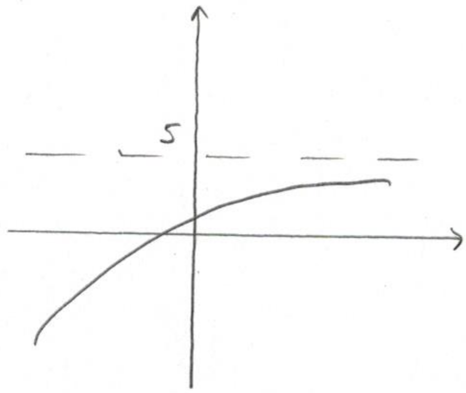
① $c = \frac{1}{100}$

② a ⊖

#10 a) $f_1(x) = -\left(\frac{1}{2}\right)^x + 5$

Allure

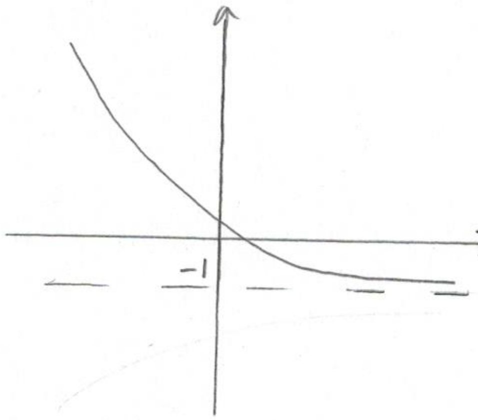




b) $f_2(x) = 5 \cdot 3^{-2x-8} - 1$

$f_2(x) = 5 \cdot 3^{-2(x+4)} - 1$

$f_2(x) = 5 \cdot \left(\frac{1}{9}\right)^{x+4} - 1$



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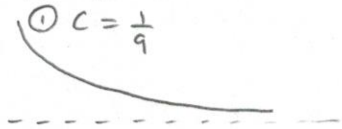
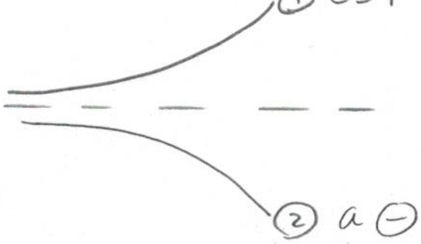
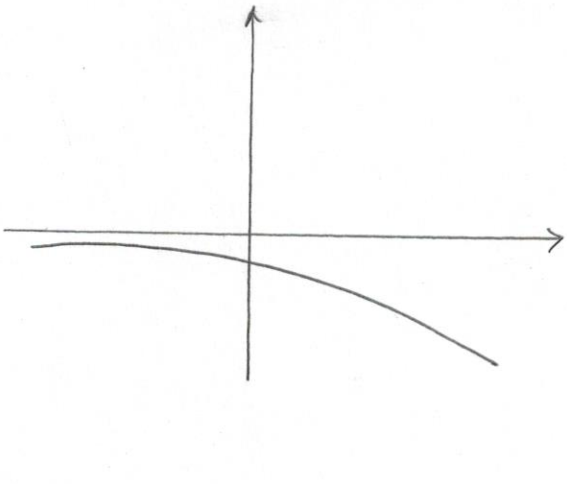


c) $f_3(x) = -2\left(\frac{1}{4}\right)^{-1x}$

$f_3(x) = -2 \cdot 4^x$

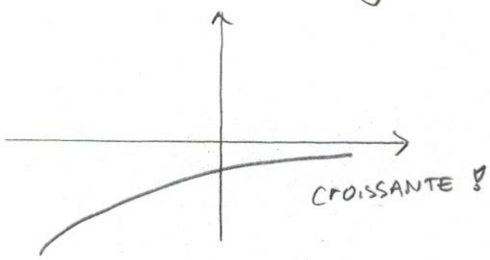
Allure

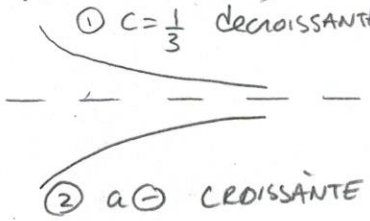




#11 a) VRAI car $y=k$ est l'équation de son asymptote

b) FAUX voici un contre-exemple $y = -2\cdot\left(\frac{1}{3}\right)^x$: Allure





c) FAUX une ft. exponenentielle n'a pas d'extrémums, car ces derniers sont non-atteint

d) VRAI $\underline{y=k \text{ horizontale}}$ ⟹ dans la réciproque $\underline{x=h \text{ verticale}}$

#12 a) $0 = 3\cdot 2^{3x-3} - 96$

$\frac{96}{3} = \frac{3\cdot 2^{3x-3}}{3}$

$32 = 2^{3x-3}$

$2^5 = 2^{3x-3}$

$5 = 3x-3$

$8 = 3x$

$\underline{\frac{8}{3} = x}$

b) $0 = 4\cdot 3^{x+5} - 4$

$\frac{4}{4} = \frac{4\cdot 3^{x+5}}{4}$

$1 = 3^{x+5}$

$3^0 = 3^{x+5}$

$0 = x+5$

$\underline{-5 = x}$

#13 a) $\frac{375}{3} = \frac{3\cdot\left(\frac{1}{25}\right)^{2x+1}}{3}$

$125 = \left(\frac{1}{25}\right)^{2x+1}$

$5^3 = \left(5^{-2}\right)^{2x+1}$

$5^3 = 5^{-4x-2}$

$3 = -4x-2$

$5 = -4x$

$\underline{\frac{-5}{4} = x}$

b) $-3e^{2x-1} + 3 = 0$

$\frac{-3e^{2x-1}}{-3} = \frac{-3}{-3}$

$e^{2x-1} = 1$

$e^{2x-1} = e^0$

$2x-1 = 0$

$2x = 1$

$\underline{x = \frac{1}{2}}$

c) $3^{2x+1}\cdot 9^{x+2} = \frac{1}{81}$

$3^{2x+1}\cdot\left(3^2\right)^{x+2} = 3^{-4}$

$3^{2x+1}\cdot 3^{2x+4} = 3^{-4}$

$3^{4x+5} = 3^{-4}$

$4x+5 = -4$

$4x = -9$

$\underline{x = \frac{-9}{4}}$

#13 d) $\dfrac{8^{2x}}{4^{2x-1}} = 16^x$

$\dfrac{(2^3)^{2x}}{(2^2)^{2x-1}} = (2^4)^x$

$\dfrac{2^{6x}}{2^{4x-2}} = 2^{4x}$

$2^{6x-(4x-2)} = 2^{4x}$

$2^{2x+2} = 2^{4x}$

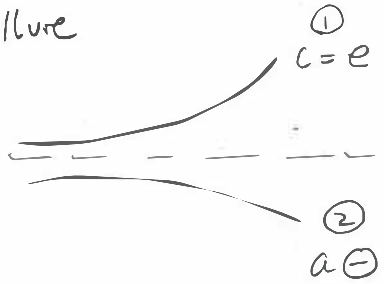
$2x+2 = 4x$

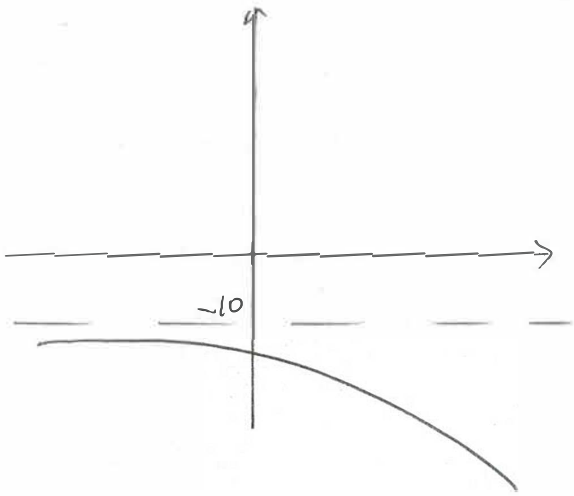
$2 = 2x$

$\underline{1 = x}$

#14 $f(x) = -2e^{x+7} - 10$

Allure





#15 $e^{2x-3} = \left(\dfrac{1}{e}\right)^{-19}$

$e^{2x-3} = e^{19}$

$2x-3 = 19$

$2x = 22$

$\underline{x = 11}$

#16 $V_f = V_i \,(\text{BASE})^{\text{période}}$

$\frac{20000}{500} = \frac{500 \cdot 3^x}{500}$ $\quad x$: nb d'heures

$40 = 3^x$

$x = \log_3 40 = \underline{3{,}36\ h}$

#17 a) $0 = 2 \cdot 0{,}8706^x - 1$

$\frac{1}{2} = \frac{2 \cdot 0{,}8706^x}{2}$

$0{,}5 = 0{,}8706^x$

$x = \log_{0{,}8706} 0{,}5 = \underline{5\text{ans}}$

b) $0 = 2 \cdot 0{,}9985^x - 1$

$\frac{1}{2} = 0{,}9985^x$

$x = \log_{0{,}9985} 0{,}5 = \underline{461{,}75\ \text{ANS}}$

c) $0 = 2 \cdot 0{,}9999^x - 1$

$\frac{1}{2} = 0{,}9999^x$

$x = \log_{0{,}9999} 0{,}5$

$x = \underline{6931{,}13\ \text{ANS}}$

#18 $V_f = V_i \cdot \text{BASE}^{\text{période}}$

Plutonium : $\frac{51{,}25}{410} = \frac{410\left(\frac{1}{2}\right)^x}{410}$ où x = nb de 24000 ANS

$0{,}125 = 0{,}5^x$

$x = \log_{0{,}5} 0{,}125$

$x = 3$ "24000" ans

$x = \underline{72000\ \text{ans}}$

Uranium : $51{,}25 = 410\left(\frac{1}{2}\right)^x$ où x = nb de $7{,}1 \times 10^8$ ans.

$0{,}125 = 0{,}5^x$

$x = \log_{0{,}5} 0{,}125$

$x = 3$ "$7{,}1 \times 10^8$ ans"

$x = \underline{21{,}3 \times 10^8\ \text{ans}}$ ou $\underline{2\,130\,000\,000\ \text{ans}}$

#19 $Vf = Vi\,(Base)^{période}$

$Vi = 3000\$$

Base = ? $4\% \rightarrow 12$ mois
$x \rightarrow 4$ mois $\quad x = 1,\overline{3}\,\% \;\Big\}\; Base = 1 + 0,01\overline{3} = 1,01\overline{3}$

$Vf = 20\,000$

$\dfrac{20000}{3000} = \dfrac{3000 \cdot (1,01\overline{3})^x}{3000}$ où x = nb de 4mois

$6,\overline{6} = 1,01\overline{3}^{\,x}$

$x = \log_{1,013} 6,\overline{6} = 143,23$ "4mois" donc $\dfrac{143,23}{3}$ ans $= \underline{\underline{47,74 \text{ ans}}}$

#20 $Vi = 2000$

Base $= 0,9 \quad (1-0,1)$

$Vf = 1$

$\Bigg\}\; \dfrac{1}{2000} = \dfrac{2000\,(0,9)^x}{2000}$ où x = nb de 7 jours.

$0,0005 = 0,9^x$

$x = \log_{0,9} 0,0005 = 72$ "7jours" donc environ $\underline{\underline{505 \text{ jours}}}$

#21 $Vf = 78000\$$

$Vi = 1800\$$

Base = ? $2,4\% \rightarrow 12$ mois
$x\% \rightarrow 6$ mois $\quad x = 1,2\% \;\Big\}\; Base = 1,012$

$\Bigg\}\; \dfrac{78\,000}{1800} = \dfrac{1800\,(1,012)^x}{1800}$ x = nb de 6 mois

$43,\overline{3} = 1,012^x$

$x = \log_{1,012} 43,\overline{3} = 315,96$ "6mois"

rép: $\dfrac{315,96}{2}$ ans ou $\underline{\underline{157,98 \text{ ans}}}$

#22

a) $0 = -2\left(\frac{1}{2}\right)^{-x+1} + 14$

$\dfrac{-14}{-2} = \dfrac{-2\left(\frac{1}{2}\right)^{-x+1}}{-2}$

$7 = \left(\frac{1}{2}\right)^{-x+1}$

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

$-x+1 = -2,81$

$\boxed{x = 3,81}$

b) $0 = 5 \cdot 3^{2x-6} - 20$

$\dfrac{20}{5} = \dfrac{5 \cdot 3^{2x-6}}{5}$

$4 = 3^{2x-6}$

$2x-6 = \log_3 4$

$2x-6 = 1,26$

$2x = 7,26$

$\boxed{x = 3,63}$

c) $0 = 3 \cdot e^{5x-2} - 19$

$\dfrac{19}{3} = \dfrac{3 \cdot e^{5x-2}}{3}$

$\dfrac{19}{3} = e^{5x-2}$

$5x-2 = \ln\left(\frac{19}{3}\right)$ car $\ln = \log_e$

$5x-2 = 1,85$

$5x = 3,85$

$\boxed{x = 0,77}$

#23a) $\log = \ominus$ oui vrai car EXPOSANT peut être $\ominus$

b) $\log \ominus = ?$ FAUX car $\log \ominus = ?$ veut dire $10^{?} = \ominus$ si la base est $\oplus$ alors la puissance le sera !!! donc $10^{?} \neq \ominus$

#24 a) $\log_2 5 + \log_2 8 = \log_2(5 \cdot 8) = \underline{\underline{\log_2 40}}$ (log d'un produit)

b) $\log_4 45 - \log_4 3 = \log_4\left(\frac{45}{3}\right) = \underline{\underline{\log_4 15}}$ (log d'un quotient)

c) $\ln 7 + \ln 8 - \ln 4 = \ln\left(\frac{7 \cdot 8}{4}\right) = \underline{\underline{\ln 14}}$ (log produit et log quotient)

d) $2\log 25 - 3\log 5$

$= \log 25^2 - \log 5^3$ log d'une puissance

$= \log 625 - \log 125$

$= \log\left(\frac{625}{125}\right)$ log d'un quotient

$= \underline{\underline{\log 5}}$

e) $\underbrace{\log_2 0{,}5 + \log_2 4}\ + 3\log_2 3$

$\log_2(0{,}5 \cdot 4) + \log_2 3^3$ log produit + log puissan

$\log_2 2 + \log_2 27 = \log_2 2 \cdot 27$ log produit

$= \underline{\underline{\log_2 54}}$

f) $\dfrac{\log_2 9}{\log_2 10} - \log 3 = \dfrac{\frac{\log 9}{\log 2}}{\frac{\log 10}{\log 2}} - \log 3$ Loi du changement de base

$= \dfrac{\log 9}{\cancel{\log 2}} \cdot \dfrac{\cancel{\log 2}}{\log 10} - \log 3$

$= \dfrac{\log 9}{\log 10} - \log 3$

$= \log 9 - \log 3$ car $\log 10 = 1$

$= \log\left(\frac{9}{3}\right)$ log du quotients

$= \underline{\log 3}$

25 a) $\log(x+2) + \log 4 - 2\log x$

$= \underbrace{\log(x+2) + \log 4} - \log x^2$: log d'une puissance

$= \log(4x+8) - \log x^2$: log produit

$= \log\left(\frac{4x+8}{x^2}\right)$: log quotient

b) $\log_a t - 2\log_a 3t + 3\log_a 2t$

$= \log_a t - \log_a (3t)^2 + \log_a (2t)^3$: log d'une puissance

$= \underbrace{\log_a t - \log_a 9t^2} + \log_a 8t^3$

$= \log_a\left(\frac{t}{9t^2}\right) + \log_a 8t^3$: log quotient

$= \log_a \frac{8t^4}{9t^2}$: log produit

$= \log_a \frac{8t^2}{9}$

#26 a) $\underbrace{\log_2 4 + \log_2 8} = 5$

$\log_2 32 = 5$ $\boxed{\text{VRAI}}$ car $2^5 = 32$

b) $\underbrace{\log_5 16 - \log_5 2} = \log_5 8$

$\log_5\left(\frac{16}{2}\right) = \log_5 8$ $\boxed{\text{VRAI}}$

c) $\log_3 8 = 3\log_3 2$

$\log_3 2^3 = 3\log_3 2$ $\boxed{\text{VRAI}}$

d) $\log_5\left(\frac{8}{13}\right) = \frac{\log_5 8}{\log_5 13}$ $\boxed{\text{FAUX}}$ car $\log_5\left(\frac{8}{13}\right) = \log_5 8 - \log_5 13$

e) $\log(4+11) = \log 4 \cdot \log 11$ $\boxed{\text{FAUX}}$ car $\log(4 \cdot 11) = \log 4 + \log 11$

f) $\frac{\log_c 7}{\log_c 12} = \log_7 12$ $\boxed{\text{FAUX}}$ car $\frac{\log_c 7}{\log_c 12} = \frac{\frac{\log 7}{\log c}}{\frac{\log 12}{\log c}} = \frac{\log 7}{\cancel{\log c}} \cdot \frac{\cancel{\log c}}{\log 12} = \frac{\log 7}{\log 12} = \log_{12} 7$!

#26 g) $\log_c\left(\frac{3}{2}\right) = \frac{1}{2}\log_c 3$ $\boxed{\text{FAUX}}$ car $\frac{1}{2}\log_c 3 = \log_c 3^{1/2} = \log_c \sqrt{3}$

h) $\underbrace{\log 6 - 4\log 2} = \log\left(\frac{6}{2}\right)$

$\log 6 - \log 2^4 = \log 3$

$\log\left(\frac{6}{16}\right) = \log 3$ $\boxed{\text{FAUX}}$

i) $\log\left(2{,}5^3\right)^2 = 6\log 2{,}5$

$\log 2{,}5^6 = \log 2{,}5^6$ $\boxed{\text{VRAI}}$

#27 $0 = -3\log_{\frac{1}{2}}(0{,}5x+0{,}5)-6$

$\frac{6}{-3} = \frac{-3\log_{\frac{1}{2}}(0{,}5x+0{,}5)}{-3}$

Exp

$-2 = \log_{\frac{1}{2}}(0{,}5x+0{,}5)$

$\left(\frac{1}{2}\right)^{-2} = 0{,}5x+0{,}5$

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

$3{,}5 = 0{,}5x$

$\boxed{7 = x}$

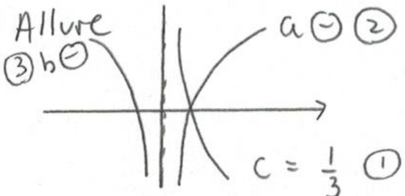
$0{,}5x+0{,}5 > 0$

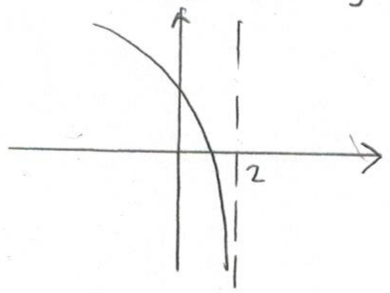
$0{,}5x > -0{,}5$

$\boxed{x > -1}$

#28 $f(x) = -4\log_{\frac{1}{3}}(-2x+4)-12$

$f(x) = -4\log_{\frac{1}{3}} -2(x-2)-12$





$0 = -4\log_{\frac{1}{3}}(-2x+4)-12$

$\frac{12}{-4} = \frac{-4\log_{\frac{1}{3}}(-2x+4)}{-4}$

Exp

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

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

$27 = -2x+4$

$23 = -2x$

$\boxed{-11{,}5 = x}$

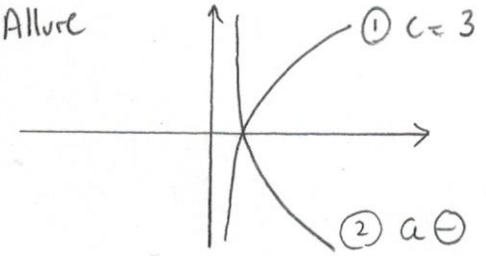
$-2x+4 > 0$

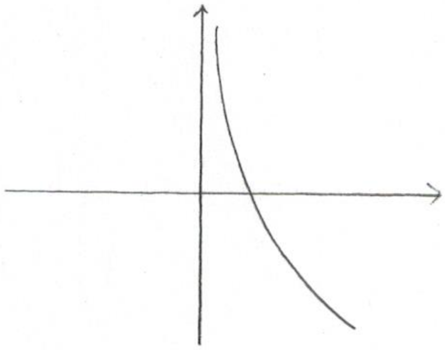
$-2x > -4$

$\boxed{x < 2}$

#28 b) $g(x) = -2\log_3(4x) + 6$

Allure





$0 = -2\log_3(4x) + 6$

$\dfrac{-6}{-2} = \dfrac{-2\log_3(4x)}{-2}$

$3 = \log_3(4x)$

Exp. $\to 3^3 = 4x$

$27 = 4x$

$\boxed{6{,}75 = x}$

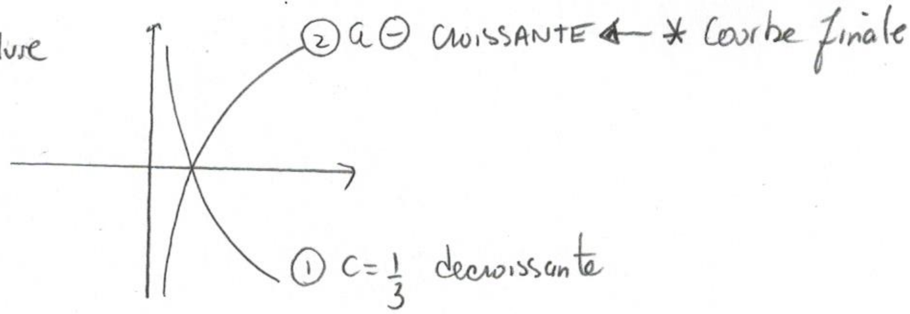
$4x > 0$

$\boxed{x > 0}$

#29 a) VRAI car $x = h$ est l'equation de l'asymptote verticale

b) FAUX voici un contre-exemple

$y = +2\log_{\frac{1}{3}} x$ Allure



c) VRAI La courbe croise toujours l'axe des "x" car l'image est ℝ.

d) FAUX si $h = 0$ l'asymptote est l'axe des "y" donc il y aurait aucune ordonnée à l'origine

e) VRAI

#30 a) $\underbrace{\log_3 x + \log_3 2}$ $= 4$ restriction $\underline{x > 0}$

$\log_3 2x = 4$: log produit

Exp. $\to 3^4 = 2x$

$81 = 2x$

$\boxed{40{,}5 = x}$

#30 b) $3\log(0.5x+2)^2 - 1 = 5$

$0.5x+2>0$

$0.5x>-2$

$\underline{x>-4}$

$6\log(0.5x+2) - 1 = 5$: log d'une puissance

$\dfrac{6\log(0.5x+2)}{6} = \dfrac{6}{6}$

Exp

$\log(0.5x+2) = 1$

$\rightarrow 10^1 = 0.5x+2$

$8 = 0.5x$

$\boxed{16 = x}$

c) $\log_6(x+3) + \log_6(x-2) = 1$

$x+3>0$ et $x-2>0$

$\underline{x>-3}$ $\underline{x>2}$

EXP

$\log_6(x^2+x-6) = 1$: log produit

$\rightarrow 6^1 = x^2+x-6$

$0 = x^2+x-12$

$0 = (x-3)(x+4)$ donc $\underline{\underline{x=3}}$ et $x=-4$ No!

d) $\log_7(14x) = \log_7(x-5) + 2$

$14x>0$ $x-5>0$

$\underline{x>0}$ $\underline{x>5}$

$\log_7(14x) - \log_7(x-5) = 2$

EXP

$\log_7\left(\dfrac{14x}{x-5}\right) = 2$: log quotient

$\rightarrow 7^2 = \dfrac{14x}{x-5}$

$49 = \dfrac{14x}{x-5}$

$49(x-5) = 14x$

$49x - 245 = 14x$

$35x = 245$

$\boxed{x = 7}$

#31 a) $y = -2\left(\frac{1}{2}\right)^{x-3} + 7$

$x = -2\left(\frac{1}{2}\right)^{y-3} + 7$

EXP

$\frac{x-7}{-2} = \left(\frac{1}{2}\right)^{y-3}$

$y - 3 = \log_{\frac{1}{2}}\left(\frac{x-7}{-2}\right)$

$y = \log_{\frac{1}{2}}\left(\frac{x-7}{-2}\right) + 3$

$y = \log_{\frac{1}{2}}(-0{,}5x + 3{,}5) + 3$

b) $y = 3\ln(x+2) - 5$

$x = 3\ln(y+2) - 5$

$y+2 > 0$

$y > -2$

EXP

$\frac{x+5}{3} = \ln(y+2)$

$e^{\frac{x+5}{3}} = y + 2$

$\boxed{e^{\frac{1}{3}(x+5)} - 2 = y}$

#32 a) $4^{3-2x} = 5^{3x}$

$4^{3-2x} = \left(4^{\log_4 5}\right)^{3x}$

$4^{3-2x} = \left(4^{1{,}16}\right)^{3x}$

$4^{3-2x} = 4^{3{,}48x}$

$3 - 2x = 3{,}48x$

$3 = 5{,}48x$

$\boxed{0{,}55 = x}$

b) $\frac{3^{x+1}}{6^{4x+5}} = 2^x$

$\frac{3^{x+1}}{\left(3^{\log_3 6}\right)^{4x+5}} = \left(3^{\log_3 2}\right)^x$

$\frac{3^{x+1}}{\left(3^{1{,}63}\right)^{4x+5}} = \left(3^{0{,}63}\right)^x$

$\frac{3^{x+1}}{3^{6{,}52x+8{,}15}} = 3^{0{,}63x}$

$3^{-5{,}52x-7{,}15} = 3^{0{,}63x}$

$-5{,}52x - 7{,}15 = 0{,}63x$

$-7{,}15 = 6{,}15x$

$\boxed{-1{,}16 = x}$

c) $2^{x-1} = 5 \cdot 7^{3x}$

$2^{x-1} = 2^{\log_2 5} \cdot \left(2^{\log_2 7}\right)^{3x}$

$2^{x-1} = 2^{2{,}32} \cdot \left(2^{2{,}81}\right)^{3x}$

$2^{x-1} = 2^{2{,}32} \cdot 2^{8{,}43x}$

$2^{x-1} = 2^{8{,}43x + 2{,}32}$

$x - 1 = 8{,}43x + 2{,}32$

$-3{,}32 = 7{,}43x$

$\boxed{-0{,}45 = x}$

#32 d) $3^{x+5} \cdot 2^{3x-1} = 5^{-2x+6}$

$$3^{x+5} \cdot \left(3^{\log_3 2}\right)^{3x-1} = \left(3^{\log_3 5}\right)^{-2x+6}$$

$$3^{x+5} \cdot \left(3^{0,63}\right)^{3x-1} = \left(3^{1,46}\right)^{-2x+6}$$

$$3^{x+5} \cdot 3^{1,89x-0,63} = 3^{-2,92x+8,76}$$

$$3^{2,89x+4,37} = 3^{-2,92x+8,76}$$

$$2,89x + 4,37 = -2,92x + 8,76$$

$$5,81x = 4,39$$

$$\boxed{x = 0,76}$$

e) $2,5 \cdot 10^{x} = 6 \cdot e^{4x-3}$

$$e^{\ln 2,5} \cdot \left(e^{\ln 10}\right)^{x} = e^{\ln 6} \cdot e^{4x-3}$$

$$e^{0,92} \cdot e^{2,30x} = e^{1,79} \cdot e^{4x-3}$$

$$e^{2,30x+0,92} = e^{4x-1,21}$$

$$2,30x + 0,92 = 4x - 1,21$$

$$-1,7x = -2,13$$

$$\boxed{x = 1,25}$$