Révisions Noël 2019
Correction des exercices

Exercices d'exécution

$6^{\text{ème}}$

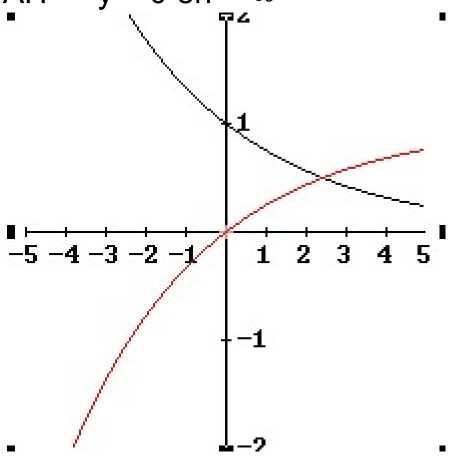
1) $g(x) = \pm\sqrt[4]{\dfrac{y+1}{-2}} - 3$

2) $\dfrac{1}{2^{4,5}} = \dfrac{1}{16\sqrt{2}} = \dfrac{\sqrt{2}}{32}$

3) x = 5/2 ; $3^x = 9$ ou $3^x = 1$
x = 2 x = 0

4) D = R ; I =]0, +∞[; décroissante ; concavité vers le haut ; $\lim\limits_{\pm\infty} = \ 0^+_{+\infty}$

AH ≡ y = 0 en + ∞



g(x) : AH ≡ y = 1 en + ∞

5) Recette prévue en 2006 : $30000000.0.88^4 = 17990860.8$ FB = 445981 €

6) 228 repas

7) Elle vaudra 200.000 € dans 11 ans
$350.000\ 0,95^x = 10.000\ 1,012^x$ d'où x = 56 ans

8) montant du capital qui avait été placé 15 ans auparavant : 21580 €
On devrait encore laisser l'argent à la banque pendant 12 ans (11,…ans)

9) a = 10 ; a = 2/3 ; a = 2

10) x = -3 , x = 2/5

11) x = -5/3 x = -1 ou x = 6 x = 1 (à rejeter) ou x = 8

$x < (\log_2 200 + 1) / 7$ $x < -19/16$ $x < 0,44$
$x < 1,23$

12)D =]- ∞,-2[U]-1,0[U]2,+ ∞[

13)(512 ;0,5)

14)D = $[-\sqrt{26},-2\sqrt{6}]U[2\sqrt{6},\sqrt{26}]$ rem : fct paire

$$f'(x) = (\frac{6x^3}{\sqrt{-x^4+50x^2-624}} - 6x\arcsin(x^2-25)).\frac{1}{9x^4}$$

$$= (\frac{x^2}{\sqrt{-x^4+50x^2-624}} - \arcsin(x^2-25)).\frac{2}{3x^3}$$

$-\sqrt{26}$		-5		$-2\sqrt{6}$
π/156	+	0	-	-π/144

D = [0,1/2]

$$f'(x) = \frac{1}{\sqrt{arcins2x}}\frac{1}{\sqrt{1-4x^2}}$$

f(x) ≥ 0

D = R

$$f'(x) = \frac{10}{1+25x^2}$$

	0	
-	0	+

D = [1/3,1]

$$f'(x) = \arccos(-3x+2) + \frac{3x}{\sqrt{-3-9x^2+12x}}$$

1/3		1
0	+	π

D = [0,+ ∞[

$$f'(x) = \frac{1}{2(1+x)\sqrt{x}}$$

f(x) ≥ 0

15) $f(x) = f_1(x)$	$D = [-3,-1]$	$I = [-\pi/2,\pi/2]$	$x = -2$
$g(x) = f_3(x)$	$D = R$	$I =]-\pi/2+3,\pi/2+3[$	$x = /$
$h(x) = f_2(x)$	$D = [-1/2,1/2]$	$I = [-\pi/2,\pi/2]$	$x = 0$

$f(x) = \log_2 x$ $\quad g(x) = 3^x$ $\quad h(x) = 2\,e^x$

16) $x \in [1/5,3/5]$

attention : l'image de arcos est $[0, \pi]$ d'où équation mal posée S = {}

$x \in [-1,1]$

$x = \sin(\text{arctg } 0.75) = 0,6$

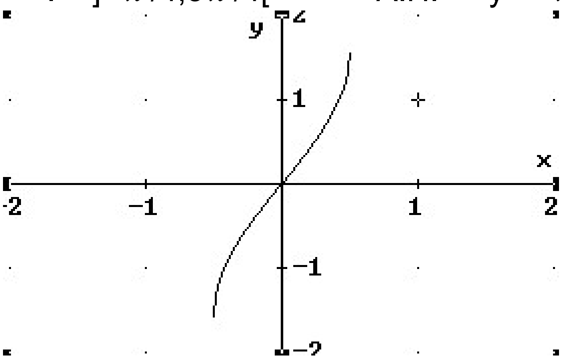
$x \in R$

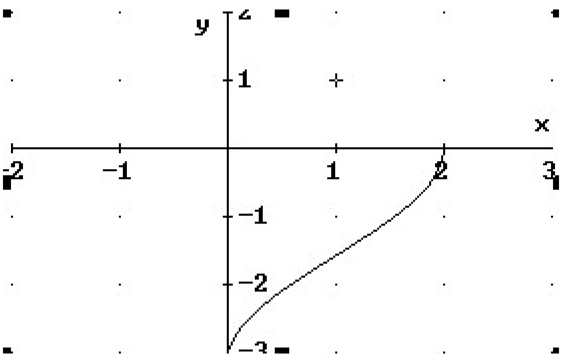
$$x = \frac{\frac{8}{3}+\frac{5}{3}}{1-\frac{8}{3}\frac{5}{3}} = -\frac{39}{31}$$

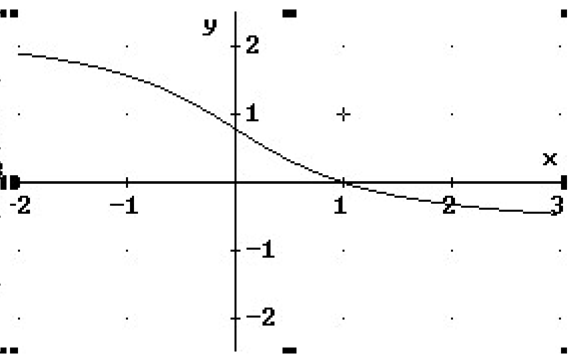
17) $I = [-\pi/2, \pi/2]$

$I = [-\pi,0]$

$I =]-\pi/4,3\pi/4[$ $\qquad$ A.H. $\equiv y = -\pi/4$ et A.H. $\equiv y = 3\pi/4$







18) $(e^{5x})' = 5\,e^{5x}$; $(x^4\,e^x)' = 4x^3\,e^x + x^4\,e^x = x^3\,e^x\,(4 + x)$; $(2e^{\sin 3x})' = 6^{e\sin 3x}\cos 3x\ldots$

19)z + z' = 6 – 2i ; -z = - 4 – 3i ; conjugué de z = 4 – 3i ; module de z' = $\sqrt{29}$

z.z' = 23 – 14i ; $\frac{1}{z} = \frac{4-3i}{25}; \frac{z'}{z} = \frac{(2-5i)(4-3i)}{25} = \frac{-7-26i}{25}$

20)1 ; i ; -1

21)a) z = $\pm\frac{3}{8}i$

b) $\Delta = 9 - 96 = -87 = 87i^2$

$x = \frac{-3 \pm \sqrt{87}i}{4}$

c) $z^2 = \frac{3i+4}{2}$ d'où après calculs, $z = \pm\frac{1}{2}(3+i)$

d) $\begin{aligned} &\Delta = 3 - 4i \\ &racine\ \Delta = \pm(2-i) \end{aligned}$

d'où après calculs, $\begin{aligned} &z = 1 - 2i \\ &z = -1 - i \end{aligned}$

22)z=2 cis π/5 ; z_1 = -z = 2 cis 6π/5 ; z_2 = conj z = 2 cis 9π/5

$z' = \frac{-3}{2}(\sqrt{3}+i) = (-2.6 - 1.5i) = 3cis\frac{7\pi}{6}$

$z = 2cis\frac{\pi}{5} \cong 2(0.81 + 0.59i)$

z_3 = z + z' = -0.98 – 0.32i ; z_4 = z – z' = 4.22 + 2.68 i

z_5 = 2z = 4 cis π/5 ; z_6 = z.z' = 6 cis 41π/30 ; z^3 = 8 cis 3π/5

23)

$z^4 = \sqrt{3} - i = 2cis\frac{11\pi}{6}$

$z_0 = \sqrt[4]{2}cis\frac{11\pi}{24}$

$z_1 = \sqrt[4]{2}cis\frac{23\pi}{24}$

$z_2 = \sqrt[4]{2}cis\frac{35\pi}{24}$

$z_3 = \sqrt[4]{2}cis\frac{47\pi}{24}$

24)

$$z^6 = 16cis\frac{11\pi}{6}$$

$$z_k^* = cis\frac{k\pi}{3}$$

$$z_0 = \sqrt[3]{4}cis\frac{11\pi}{36}$$

$$z_1 = \sqrt[3]{4}cis\frac{11\pi}{36}cis\frac{\pi}{3}$$

$$z_2 = \sqrt[3]{4}cis\frac{11\pi}{36}cis\frac{2\pi}{3}$$

$$z_3 = \sqrt[3]{4}cis\frac{11\pi}{36}cis\pi$$

$$z_4 = \sqrt[3]{4}cis\frac{11\pi}{36}cis\frac{4\pi}{3}$$

$$z_5 = \sqrt[3]{4}cis\frac{11\pi}{36}cis\frac{5\pi}{3}$$

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25)Soit z = 3 + i .= √10 cis 0,32

a) z_1 image de z par la rotation de centre A(2,4) et d'amplitude 30° :
translation OA : z_1' = 3 + i – 2 – 4i = 1 – 3i = √10 cis (-1,25) = √10 cis 5,03

z_1 = √10 cis 5,03 cis (π/6) = √10 cis 5,56
b) z_2 image de z par l'homothétie de centre O et de rapport -0.25

z_2 = √10 0.25 cis (0,32+π) = 0,80 cis 3,46