

I) $f: \mathbb{R} \rightarrow \mathbb{R}$
 $x \mapsto \frac{e^x - e^{-x}}{2} = \text{sh}(x)$

Remarquer que f est impaire!

1) $D_f = \mathbb{R} = D_{f'}$, donc pas d'A.V.

• $\lim_{x \rightarrow \pm \infty} f(x) = \pm \infty$ donc pas d'A.M.

4p

• $\lim_{x \rightarrow +\infty} \frac{f(x)}{x} = \lim_{x \rightarrow +\infty} \frac{1}{2} \left(\frac{e^x}{x} - \frac{e^{-x}}{x} \right) = \lim_{x \rightarrow +\infty} \frac{1}{2} \left(\frac{e^x}{x} - \frac{1}{xe^x} \right) = \left. \begin{array}{l} \begin{array}{l} \text{"} +\infty - 0 \text{"} \\ \nearrow \text{si } x \rightarrow +\infty \\ \searrow \text{si } x \rightarrow -\infty \\ \text{"} 0 - (+\infty) \text{"} \end{array} \\ \end{array} \right\} = +\infty$

donc $\lim_{x \rightarrow +\infty} \frac{f(x)}{x} = +\infty$, donc pas d'A.O., (Bp. de dir. Oy.)

«Car l'exponentielle l'emporte sur x »

2) $f'(x) = \frac{e^x + e^{-x}}{2} (= \text{ch } x), \forall x \in \mathbb{R}$

2p

x	$-\infty$	$+\infty$
f'(x)		+
f(x)	$-\infty$	$+\infty$

3) $f''(x) = \frac{e^x - e^{-x}}{2} = f(x) (\forall x \in \mathbb{R})$

$f''(x) = 0 \Leftrightarrow e^x = e^{-x} \quad | \cdot e^x$

$\Leftrightarrow e^{2x} = 1$

$\Leftrightarrow x = 0$ et comme

3p

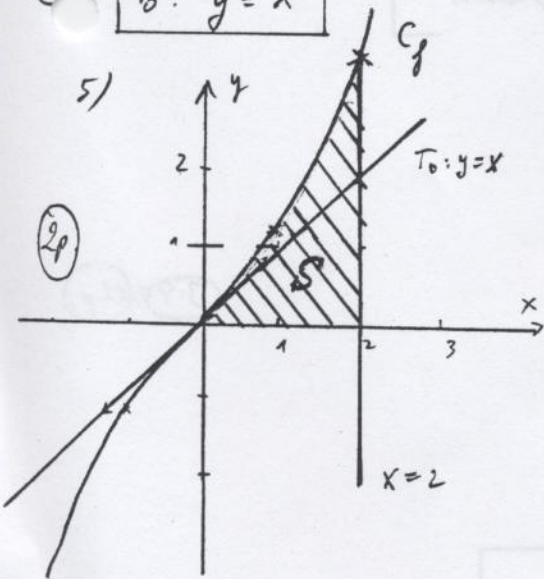
$f''(x)$ change de signe pour $x=0$, l'origine est un point d'inflexion pour C_f

4) T: $y = f(x) + f'(x_0)(x - x_0)$, $x_0 = 0$ or $f(0) = 0$ et $f'(0) = 1$

2p

$T_0: y = x$

5)



$C_f \cap x = \{0(0)\}$

6) $A = \int_0^2 f(x) - 0 \, dx = \int_0^2 \frac{e^x - e^{-x}}{2} \, dx$
 $= \left[\frac{e^x}{2} + \frac{e^x}{2} \right]_0^2 \approx 2,76 \text{ u.a.} \approx 11 \text{ cm}^2$

2p

7) $V = \pi \int_0^2 f^2(x) \, dx$

$= \pi \int_0^2 \left(\frac{e^x - e^{-x}}{2} \right)^2 \, dx$

$= \frac{\pi}{4} \int_0^2 (e^{2x} - 2 + e^{-2x}) \, dx$

$= \frac{\pi}{4} \left[\frac{e^{2x}}{2} - 2x + \frac{e^{-2x}}{-2} \right]_0^2$

$\approx \frac{\pi}{4} \cdot 23,3$

$V \approx 18,3 \text{ m.d.v.}$

$V \approx 146,33 \text{ cm}^3$

(unités: 2cm.2cm.2cm)

4p

13p

II)

• $I_1(x) = \int \sin^2 x \cdot \cos^3 x \, dx + \int \frac{4}{x^3+4x} \, dx$
v200 ↓ t collect *v200* ↓ Expand

C.E.: $x \in \mathbb{R}^0$

$= -\frac{1}{16} \int (\cos 5x + \cos 3x - 2 \cos x) \, dx + \int \left(\frac{1}{x} - \frac{x}{x^2+4} \right) \, dx$
 $= -\frac{1}{80} \sin 5x - \frac{1}{48} \sin 3x + \frac{1}{8} \sin x + \ln|x| - \frac{1}{2} \ln|x^2+4| + c, \quad c \in \mathbb{R}$

$I_1(x) = -\frac{1}{80} \sin 5x - \frac{1}{48} \sin 3x + \frac{1}{8} \sin x + \ln \frac{|x|}{\sqrt{x^2+4}} + c, \quad c \in \mathbb{R}$

N.B.: on sin: $\int \sin^2 x \cos^3 x \, dx = \int \sin^2 x \cdot (1-\sin^2 x) \cdot \cos x \, dx = \int \sin^2 x \cos x - \sin^4 x \cos x \, dx$
 ("à la main") $= \frac{1}{3} \sin^3 x - \frac{1}{5} \sin^5 x + K, \quad (K \in \mathbb{R})$

• $I_2 = \int_0^1 x^2 e^{-x} \, dx$ intégrer par parties: $u(x) = x^2 \Rightarrow u'(x) = 2x$ C.E. $x \in \mathbb{R}$
 $v'(x) = e^{-x} \Rightarrow v(x) = -e^{-x}$

$= [-x^2 e^{-x}]_0^1 + 2 \int_0^1 x e^{-x} \, dx$ intégrer par parties: $u(x) = x \Rightarrow u'(x) = 1$
 $v'(x) = e^{-x} \Rightarrow v(x) = -e^{-x}$
 $= -\frac{1}{e} + 2 [-x e^{-x}]_0^1 + 2 \int_0^1 e^{-x} \, dx$ or $\int_0^1 e^{-x} \, dx = [-e^{-x}]_0^1 = -\frac{1}{e} + 1$
 $= -\frac{1}{e} - \frac{2}{e} + 2(-\frac{1}{e} + 2)$

$I_2 = -\frac{5}{e} + 2 \approx 0,16$

• $I_3(x) = \int \frac{1}{\cos^4 x} \, dx$ i.p.p. $u(x) = \frac{1}{\cos^2 x} \Rightarrow u'(x) = \frac{2 \sin x}{\cos^3 x}$ C.E. $x + \frac{\pi}{2} + k\pi, k \in \mathbb{Z}$
 $v(x) = \frac{1}{\cos^2 x} \Rightarrow v(x) = \tan x$

$= \frac{\tan x}{\cos^2 x} - 2 \int \frac{\sin x \tan x}{\cos^3 x} \, dx$
 $= \frac{\sin x}{\cos^3 x} - 2 \int \frac{\sin^2 x}{\cos^4 x} \, dx$ or $\sin^2 x = 1 - \cos^2 x$

3.9 = 12p.

$I_3(x) = \frac{\sin x}{\cos^3 x} - 2 I_3(x) + 2 \int \frac{1}{\cos^2 x} \, dx \quad | +2 I_3(x)$

$3 I_3(x) = \frac{\sin x}{\cos^3 x} + 2 \tan x + c, \quad c \in \mathbb{R} \quad | :3$

d'après $I_3(x) = \frac{\sin x}{3 \cos^3 x} + \frac{2}{3} \tan x + c', \quad c' \in \mathbb{R}$

III) 1) $e^x + e^{1-x} = e + 1$ (*) C.E. : $x \in \mathbb{R}$

$\forall x \in \mathbb{R}$, l'équation s'écrit en multipliant par e^x les deux membres :

$e^{2x} + e^1 = (e+1)e^x$ pour $y = e^x$
 $\Leftrightarrow y^2 - (e+1)y + e = 0$ eq. du 2° degré

$\Leftrightarrow y = 1$ ou $y = e$

$\Leftrightarrow e^x = 1$ ou $e^x = e$

$\Leftrightarrow x = 0$ ou $x = 1$ d'où $S = \{0, 1\}$

3p

2) $2 \ln(2x-1) - \ln(3x-2x^2) > \ln(4x-3) - \ln x$ (*)

C.E. : $\begin{cases} 2x-1 > 0 \\ 3x-2x^2 > 0 \\ 4x-3 > 0 \\ x > 0 \end{cases} \Leftrightarrow \begin{cases} x > \frac{1}{2} \\ 0 < x < \frac{3}{2} \\ x > \frac{3}{4} \\ x > 0 \end{cases}$ d'où $D =]\frac{3}{4}, \frac{3}{2}[$

$\forall x \in]\frac{3}{4}, \frac{3}{2}[$, (*) $\Leftrightarrow \ln \frac{(2x-1)^2}{3x-2x^2} > \ln \frac{4x-3}{x}$ | $\ln \uparrow$

$\Leftrightarrow \frac{(2x-1)^2}{3x-2x^2} > \frac{4x-3}{x}$ or $\begin{matrix} 3x-2x^2 > 0 \\ x > 0 \end{matrix}$

$\Leftrightarrow x(2x-1)^2 > (3x-2x^2)(4x-3)$

$\Leftrightarrow 4x^3 - 4x^2 + x > -8x^3 + 12x^2 - 9x$

$\Leftrightarrow 12x^3 - 22x^2 + 10x > 0$

$\Leftrightarrow 2x(6x^2 - 11x + 5) > 0$

$\Leftrightarrow 2x \cdot f(x) > 0$

$\Leftrightarrow x \in]\frac{3}{4}, \frac{5}{6}[\cup]1, \frac{3}{2}[= S$

x	$\frac{3}{4}$	$+$	$\frac{5}{6}$	$+$	1	$+$	$\frac{3}{2}$
$f(x)$		$+$	0	$-$	0	$+$	
$2x \cdot f(x)$	///	$+$	0	$-$	0	$+$	///

5p

3) $\lim_{x \rightarrow 0^+} x^2 \ln x^4 = "0 \cdot (-\infty)"$ fi

$= \lim_{x \rightarrow 0^+} \frac{-\ln x^4}{\frac{1}{x^2}} = \frac{-\infty}{+\infty}$ di

$\stackrel{(H)}{=} \lim_{x \rightarrow 0^+} \frac{(\frac{4}{x})}{(-\frac{2}{x^3})}$

$= \lim_{x \rightarrow 0^+} (-2x^2) = 0$

3.2 = 6p

14p

$\lim_{x \rightarrow 0^-} e^{\frac{1}{x}} \ln(2^2+1) = 0 \cdot 0 = 0$

$\lim_{x \rightarrow +\infty} (1 + \frac{4}{x})^{3x-7}$
 $= \lim_{x \rightarrow +\infty} (1 + \frac{1}{\frac{x}{4}})^{3x} \cdot (1 + \frac{4}{x})^{-7}$
 $= \lim_{\frac{x}{4} \rightarrow +\infty} \left[\left(1 + \frac{1}{\frac{x}{4}}\right)^{\frac{x}{4} \cdot 12} \right]^{12} \cdot \underbrace{\left(1 + \frac{4}{x}\right)^{-7}}_{\rightarrow 1}$
 $= e^{12}$

Examen de fin d'études secondaires : Section C

Corrigé du problème :

- 1) a) $q = 3 \cdot 11g = 33g$, donc $f(t) = \frac{33}{29,5}(1 - e^{-9t}) - 0,145t$
 L'écran graphique de la V200 donne les racines $t = 0$ (évident) et $t = \alpha = 7,715h (= 7h 42,9')$
 Ainsi sur l'intervalle $[0, \alpha]$, la personne a de l'alcool dans le sang.

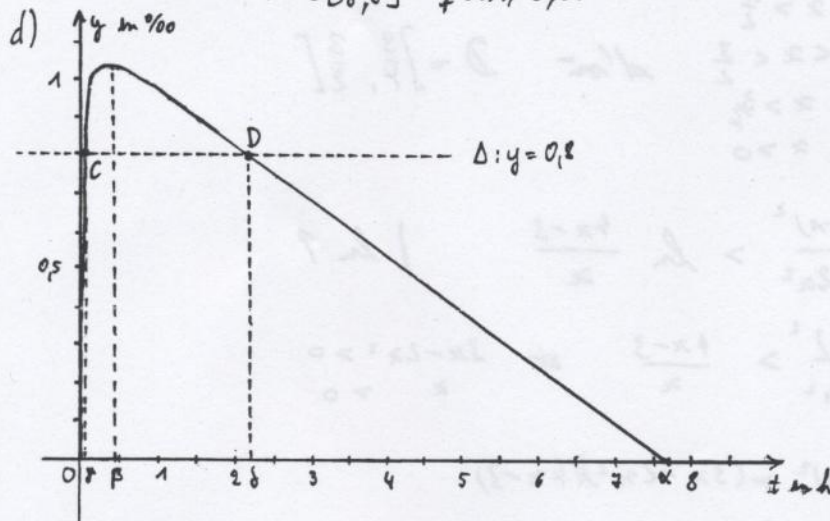
- b) $\forall x \in [0, \alpha]$ $f'(t) = -0,145 \cdot e^{-9t} (e^{9t} - 69,433)$
 $f'(t) = 0 \Leftrightarrow e^{9t} - 69,433 = 0 \Leftrightarrow t = \beta \approx 0,471h (= 28,26')$
 $f'(t) > 0 \Leftrightarrow -(e^{9t} - 69,433) > 0 \Leftrightarrow t < \beta$ et $f'(t) < 0 \Leftrightarrow -(e^{9t} - 69,433) < 0 \Leftrightarrow t > \beta$.

Tableau de variation :

t	0	β	α
$f'(t)$		+	0
$f(t)$	0	$\rightarrow f(\beta)$ max	0

$$f(\beta) \approx 1,034\%$$

- c) Soit $y_2(x) = 0,8$ et $\Delta = y = 0,8$.
 Graphiquement, la V200 donne $\mathcal{C}_f \cap \Delta = \{C(\gamma; 0,8); D(\delta; 0,8)\}$ avec $\gamma \approx 0,147h = 8,82'$ et $\delta = 2,198h = 2h 11,88'$
 Ainsi la personne ne devrait pas conduire pendant l'intervalle $[\gamma, \delta]$ car d'après le tableau de variation $\forall t \in [\gamma, \delta]$ $f(t) \geq 0,8$.



e) effet = $\int_0^{\alpha} f(t) dt \approx 4,191$

- 2) a) $f(t) = \frac{33}{29,5}(1 - e^{-12t}) - 0,145t$, $f'(t) = 0 \Leftrightarrow t = 1,855h$ et $f(1,855) \approx 0,729 < 0,8$
 Donc le taux d'alcoolémie ne dépasse pas le seuil de $0,8\%$.

- b) $f(t) = \frac{44}{29,5}(1 - e^{-12t}) - 0,145t$, $f'(t) = 0 \Leftrightarrow t = 2,094h$ et $f(2,094) \approx 1,067 > 0,8$
 Ainsi la personne ne devrait pas boire un quatrième verre.

Examen de fin d'études secondaires : Section C

Problème : Écrans de la V200

1) a)

F1 Algebra F2 Calc F3 Other F4 Prgm F5 IO F6 Clean Up

$\frac{33}{29.5} \cdot (1 - e^{-9 \cdot t}) - .145 \cdot t + f(t)$ Done

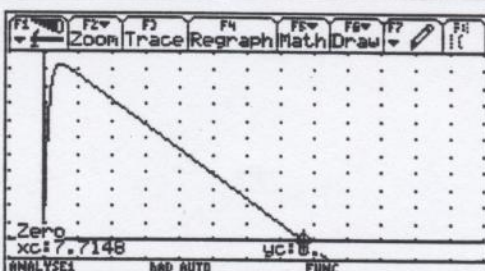
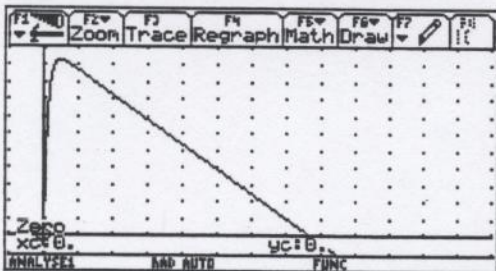
$\frac{33}{29.5} \cdot (1 - e^{-9 \cdot t}) - .145 \cdot t + f(t)$

ANALYSE1 MAD AUTO FUNC 1/20

F1 Zoom

Xmin=-1
Xmax=13
Xscl=1
Ymin=-1
Ymax=1
Yscl=1
Xres=1

ANALYSE1 MAD AUTO FUNC



1) b)

F1 Algebra F2 Calc F3 Other F4 Prgm F5 IO F6 Clean Up

$\frac{33}{29.5} \cdot (1 - e^{-9 \cdot t}) - .145 \cdot t + f(t)$ Done

$\frac{d}{dt}(f(t))$ $-.145 \cdot e^{-9 \cdot t} \cdot (e^{9 \cdot t} - 69.433)$

zeros($\frac{d}{dt}(f(t)), t$) (1.47115)

$f(1.47115149822458)$ (1.0342)

$f(1.47115149822458)$

ANALYSE1 MAD AUTO FUNC 4/20

1) c)

F1 Zoom

Y1=f(x)
Y2=.8
Y3=
Y4=
Y5=
Y6=
Y7=
Y8=
Y9=
Y10=
Y11=
Y12=
Y13=
Y14=
Y15=
Y16=
Y17=
Y18=
Y19=
Y20=
Y21=
Y22=
Y23=
Y24=
Y25=
Y26=
Y27=
Y28=
Y29=
Y30=
Y31=
Y32=
Y33=
Y34=
Y35=
Y36=
Y37=
Y38=
Y39=
Y40=
Y41=
Y42=
Y43=
Y44=
Y45=
Y46=
Y47=
Y48=
Y49=
Y50=
Y51=
Y52=
Y53=
Y54=
Y55=
Y56=
Y57=
Y58=
Y59=
Y60=
Y61=
Y62=
Y63=
Y64=
Y65=
Y66=
Y67=
Y68=
Y69=
Y70=
Y71=
Y72=
Y73=
Y74=
Y75=
Y76=
Y77=
Y78=
Y79=
Y80=
Y81=
Y82=
Y83=
Y84=
Y85=
Y86=
Y87=
Y88=
Y89=
Y90=
Y91=
Y92=
Y93=
Y94=
Y95=
Y96=
Y97=
Y98=
Y99=
Y100=
Y101=
Y102=
Y103=
Y104=
Y105=
Y106=
Y107=
Y108=
Y109=
Y110=
Y111=
Y112=
Y113=
Y114=
Y115=
Y116=
Y117=
Y118=
Y119=
Y120=
Y121=
Y122=
Y123=
Y124=
Y125=
Y126=
Y127=
Y128=
Y129=
Y130=
Y131=
Y132=
Y133=
Y134=
Y135=
Y136=
Y137=
Y138=
Y139=
Y140=
Y141=
Y142=
Y143=
Y144=
Y145=
Y146=
Y147=
Y148=
Y149=
Y150=
Y151=
Y152=
Y153=
Y154=
Y155=
Y156=
Y157=
Y158=
Y159=
Y160=
Y161=
Y162=
Y163=
Y164=
Y165=
Y166=
Y167=
Y168=
Y169=
Y170=
Y171=
Y172=
Y173=
Y174=
Y175=
Y176=
Y177=
Y178=
Y179=
Y180=
Y181=
Y182=
Y183=
Y184=
Y185=
Y186=
Y187=
Y188=
Y189=
Y190=
Y191=
Y192=
Y193=
Y194=
Y195=
Y196=
Y197=
Y198=
Y199=
Y200=
Y201=
Y202=
Y203=
Y204=
Y205=
Y206=
Y207=
Y208=
Y209=
Y210=
Y211=
Y212=
Y213=
Y214=
Y215=
Y216=
Y217=
Y218=
Y219=
Y220=
Y221=
Y222=
Y223=
Y224=
Y225=
Y226=
Y227=
Y228=
Y229=
Y230=
Y231=
Y232=
Y233=
Y234=
Y235=
Y236=
Y237=
Y238=
Y239=
Y240=
Y241=
Y242=
Y243=
Y244=
Y245=
Y246=
Y247=
Y248=
Y249=
Y250=
Y251=
Y252=
Y253=
Y254=
Y255=
Y256=
Y257=
Y258=
Y259=
Y260=
Y261=
Y262=
Y263=
Y264=
Y265=
Y266=
Y267=
Y268=
Y269=
Y270=
Y271=
Y272=
Y273=
Y274=
Y275=
Y276=
Y277=
Y278=
Y279=
Y280=
Y281=
Y282=
Y283=
Y284=
Y285=
Y286=
Y287=
Y288=
Y289=
Y290=
Y291=
Y292=
Y293=
Y294=
Y295=
Y296=
Y297=
Y298=
Y299=
Y300=
Y301=
Y302=
Y303=
Y304=
Y305=
Y306=
Y307=
Y308=
Y309=
Y310=
Y311=
Y312=
Y313=
Y314=
Y315=
Y316=
Y317=
Y318=
Y319=
Y320=
Y321=
Y322=
Y323=
Y324=
Y325=
Y326=
Y327=
Y328=
Y329=
Y330=
Y331=
Y332=
Y333=
Y334=
Y335=
Y336=
Y337=
Y338=
Y339=
Y340=
Y341=
Y342=
Y343=
Y344=
Y345=
Y346=
Y347=
Y348=
Y349=
Y350=
Y351=
Y352=
Y353=
Y354=
Y355=
Y356=
Y357=
Y358=
Y359=
Y360=
Y361=
Y362=
Y363=
Y364=
Y365=
Y366=
Y367=
Y368=
Y369=
Y370=
Y371=
Y372=
Y373=
Y374=
Y375=
Y376=
Y377=
Y378=
Y379=
Y380=
Y381=
Y382=
Y383=
Y384=
Y385=
Y386=
Y387=
Y388=
Y389=
Y390=
Y391=
Y392=
Y393=
Y394=
Y395=
Y396=
Y397=
Y398=
Y399=
Y400=
Y401=
Y402=
Y403=
Y404=
Y405=
Y406=
Y407=
Y408=
Y409=
Y410=
Y411=
Y412=
Y413=
Y414=
Y415=
Y416=
Y417=
Y418=
Y419=
Y420=
Y421=
Y422=
Y423=
Y424=
Y425=
Y426=
Y427=
Y428=
Y429=
Y430=
Y431=
Y432=
Y433=
Y434=
Y435=
Y436=
Y437=
Y438=
Y439=
Y440=
Y441=
Y442=
Y443=
Y444=
Y445=
Y446=
Y447=
Y448=
Y449=
Y450=
Y451=
Y452=
Y453=
Y454=
Y455=
Y456=
Y457=
Y458=
Y459=
Y460=
Y461=
Y462=
Y463=
Y464=
Y465=
Y466=
Y467=
Y468=
Y469=
Y470=
Y471=
Y472=
Y473=
Y474=
Y475=
Y476=
Y477=
Y478=
Y479=
Y480=
Y481=
Y482=
Y483=
Y484=
Y485=
Y486=
Y487=
Y488=
Y489=
Y490=
Y491=
Y492=
Y493=
Y494=
Y495=
Y496=
Y497=
Y498=
Y499=
Y500=
Y501=
Y502=
Y503=
Y504=
Y505=
Y506=
Y507=
Y508=
Y509=
Y510=
Y511=
Y512=
Y513=
Y514=
Y515=
Y516=
Y517=
Y518=
Y519=
Y520=
Y521=
Y522=
Y523=
Y524=
Y525=
Y526=
Y527=
Y528=
Y529=
Y530=
Y531=
Y532=
Y533=
Y534=
Y535=
Y536=
Y537=
Y538=
Y539=
Y540=
Y541=
Y542=
Y543=
Y544=
Y545=
Y546=
Y547=
Y548=
Y549=
Y550=
Y551=
Y552=
Y553=
Y554=
Y555=
Y556=
Y557=
Y558=
Y559=
Y560=
Y561=
Y562=
Y563=
Y564=
Y565=
Y566=
Y567=
Y568=
Y569=
Y570=
Y571=
Y572=
Y573=
Y574=
Y575=
Y576=
Y577=
Y578=
Y579=
Y580=
Y581=
Y582=
Y583=
Y584=
Y585=
Y586=
Y587=
Y588=
Y589=
Y590=
Y591=
Y592=
Y593=
Y594=
Y595=
Y596=
Y597=
Y598=
Y599=
Y600=
Y601=
Y602=
Y603=
Y604=
Y605=
Y606=
Y607=
Y608=
Y609=
Y610=
Y611=
Y612=
Y613=
Y614=
Y615=
Y616=
Y617=
Y618=
Y619=
Y620=
Y621=
Y622=
Y623=
Y624=
Y625=
Y626=
Y627=
Y628=
Y629=
Y630=
Y631=
Y632=
Y633=
Y634=
Y635=
Y636=
Y637=
Y638=
Y639=
Y640=
Y641=
Y642=
Y643=
Y644=
Y645=
Y646=
Y647=
Y648=
Y649=
Y650=
Y651=
Y652=
Y653=
Y654=
Y655=
Y656=
Y657=
Y658=
Y659=
Y660=
Y661=
Y662=
Y663=
Y664=
Y665=
Y666=
Y667=
Y668=
Y669=
Y670=
Y671=
Y672=
Y673=
Y674=
Y675=
Y676=
Y677=
Y678=
Y679=
Y680=
Y681=
Y682=
Y683=
Y684=
Y685=
Y686=
Y687=
Y688=
Y689=
Y690=
Y691=
Y692=
Y693=
Y694=
Y695=
Y696=
Y697=
Y698=
Y699=
Y700=
Y701=
Y702=
Y703=
Y704=
Y705=
Y706=
Y707=
Y708=
Y709=
Y710=
Y711=
Y712=
Y713=
Y714=
Y715=
Y716=
Y717=
Y718=
Y719=
Y720=
Y721=
Y722=
Y723=
Y724=
Y725=
Y726=
Y727=
Y728=
Y729=
Y730=
Y731=
Y732=
Y733=
Y734=
Y735=
Y736=
Y737=
Y738=
Y739=
Y740=
Y741=
Y742=
Y743=
Y744=
Y745=
Y746=
Y747=
Y748=
Y749=
Y750=
Y751=
Y752=
Y753=
Y754=
Y755=
Y756=
Y757=
Y758=
Y759=
Y760=
Y761=
Y762=
Y763=
Y764=
Y765=
Y766=
Y767=
Y768=
Y769=
Y770=
Y771=
Y772=
Y773=
Y774=
Y775=
Y776=
Y777=
Y778=
Y779=
Y780=
Y781=
Y782=
Y783=
Y784=
Y785=
Y786=
Y787=
Y788=
Y789=
Y790=
Y791=
Y792=
Y793=
Y794=
Y795=
Y796=
Y797=
Y798=
Y799=
Y800=
Y801=
Y802=
Y803=
Y804=
Y805=
Y806=
Y807=
Y808=
Y809=
Y810=
Y811=
Y812=
Y813=
Y814=
Y815=
Y816=
Y817=
Y818=
Y819=
Y820=
Y821=
Y822=
Y823=
Y824=
Y825=
Y826=
Y827=
Y828=
Y829=
Y830=
Y831=
Y832=
Y833=
Y834=
Y835=
Y836=
Y837=
Y838=
Y839=
Y840=
Y841=
Y842=
Y843=
Y844=
Y845=
Y846=
Y847=
Y848=
Y849=
Y850=
Y851=
Y852=
Y853=
Y854=
Y855=
Y856=
Y857=
Y858=
Y859=
Y860=
Y861=
Y862=
Y863=
Y864=
Y865=
Y866=
Y867=
Y868=
Y869=
Y870=
Y871=
Y872=
Y873=
Y874=
Y875=
Y876=
Y877=
Y878=
Y879=
Y880=
Y881=
Y882=
Y883=
Y884=
Y885=
Y886=
Y887=
Y888=
Y889=
Y890=
Y891=
Y892=
Y893=
Y894=
Y895=
Y896=
Y897=
Y898=
Y899=
Y900=
Y901=
Y902=
Y903=
Y904=
Y905=
Y906=
Y907=
Y908=
Y909=
Y910=
Y911=
Y912=
Y913=
Y914=
Y915=
Y916=
Y917=
Y918=
Y919=
Y920=
Y921=
Y922=
Y923=
Y924=
Y925=
Y926=
Y927=
Y928=
Y929=
Y930=
Y931=
Y932=
Y933=
Y934=
Y935=
Y936=
Y937=
Y938=
Y939=
Y940=
Y941=
Y942=
Y943=
Y944=
Y945=
Y946=
Y947=
Y948=
Y949=
Y950=
Y951=
Y952=
Y953=
Y954=
Y955=
Y956=
Y957=
Y958=
Y959=
Y960=
Y961=
Y962=
Y963=
Y964=
Y965=
Y966=
Y967=
Y968=
Y969=
Y970=
Y971=
Y972=
Y973=
Y974=
Y975=
Y976=
Y977=
Y978=
Y979=
Y980=
Y981=
Y982=
Y983=
Y984=
Y985=
Y986=
Y987=
Y988=
Y989=
Y990=
Y991=
Y992=
Y993=
Y994=
Y995=
Y996=
Y997=
Y998=
Y999=
Y1000=
Y1001=
Y1002=
Y1003=
Y1004=
Y1005=
Y1006=
Y1007=
Y1008=
Y1009=
Y1010=
Y1011=
Y1012=
Y1013=
Y1014=
Y1015=
Y1016=
Y1017=
Y1018=
Y1019=
Y1020=
Y1021=
Y1022=
Y1023=
Y1024=
Y1025=
Y1026=
Y1027=
Y1028=
Y1029=
Y1030=
Y1031=
Y1032=
Y1033=
Y1034=
Y1035=
Y1036=
Y1037=
Y1038=
Y1039=
Y1040=
Y1041=
Y1042=
Y1043=
Y1044=
Y1045=
Y1046=
Y1047=
Y1048=
Y1049=
Y1050=
Y1051=
Y1052=
Y1053=
Y1054=
Y1055=
Y1056=
Y1057=
Y1058=
Y1059=
Y1060=
Y1061=
Y1062=
Y1063=
Y1064=
Y1065=
Y1066=
Y1067=
Y1068=
Y1069=
Y1070=
Y1071=
Y1072=
Y1073=
Y1074=
Y1075=
Y1076=
Y1077=
Y1078=
Y1079=
Y1080=
Y1081=
Y1082=
Y1083=
Y1084=
Y1085=
Y1086=
Y1087=
Y1088=
Y1089=
Y1090=
Y1091=
Y1092=
Y1093=
Y1094=
Y1095=
Y1096=
Y1097=
Y1098=
Y1099=
Y1100=
Y1101=
Y1102=
Y1103=
Y1104=
Y1105=
Y1106=
Y1107=
Y1108=
Y1109=
Y1110=
Y1111=
Y1112=
Y1113=
Y1114=
Y1115=
Y1116=
Y1117=
Y1118=
Y1119=
Y1120=
Y1121=
Y1122=
Y1123=
Y1124=
Y1125=
Y1126=
Y1127=
Y1128=
Y1129=
Y1130=
Y1131=
Y1132=
Y1133=
Y1134=
Y1135=
Y1136=
Y1137=
Y1138=
Y1139=
Y1140=
Y1141=
Y1142=
Y1143=
Y1144=
Y1145=
Y1146=
Y1147=
Y1148=
Y1149=
Y1150=
Y1151=
Y1152=
Y1153=
Y1154=
Y1155=
Y1156=
Y1157=
Y1158=
Y1159=
Y1160=
Y1161=
Y1162=
Y1163=
Y1164=
Y1165=
Y1166=
Y1167=
Y1168=
Y1169=
Y1170=
Y1171=
Y1172=
Y1173=
Y1174=
Y1175=
Y1176=
Y1177=
Y1178=
Y1179=
Y1180=
Y1181=
Y1182=
Y1183=
Y1184=
Y1185=
Y1186=
Y1187=
Y1188=
Y1189=
Y1190=
Y1191=
Y1192=
Y1193=
Y1194=
Y1195=
Y1196=
Y1197=
Y1198=
Y1199=
Y1200=
Y1201=
Y1202=
Y1203=
Y1204=
Y1205=
Y1206=
Y1207=
Y1208=
Y1209=
Y1210=
Y1211=
Y1212=
Y1213=
Y1214=
Y1215=
Y1216=
Y1217=
Y1218=
Y1219=
Y1220=
Y1221=
Y1222=
Y1223=
Y1224=
Y1225=
Y1226=
Y1227=
Y1228=
Y1229=
Y1230=
Y1231=
Y1232=
Y1233=
Y1234=
Y1235=
Y1236=
Y1237=
Y1238=
Y1239=
Y1240=
Y1241=
Y1242=
Y1243=
Y1244=
Y1245=
Y1246=
Y1247=
Y1248=
Y1249=
Y1250=
Y1251=
Y1252=
Y1253=
Y1254=
Y1255=
Y1256=
Y1257=
Y1258=
Y1259=
Y1260=
Y1261=
Y1262=
Y1263=
Y1264=
Y1265=
Y1266=
Y1267=
Y1268=
Y1269=
Y1270=
Y1271=
Y1272=
Y1273=
Y1274=
Y1275=
Y1276=
Y1277=
Y1278=
Y1279=
Y1280=
Y1281=
Y1282=
Y1283=
Y1284=
Y1285=
Y1286=
Y1287=
Y1288=
Y1289=
Y1290=
Y1291=
Y1292=
Y1293=
Y1294=
Y1295=
Y1296=
Y1297=
Y1298=
Y1299=
Y1300=
Y1301=
Y1302=
Y1303=
Y1304=
Y1305=
Y1306=
Y1307=
Y1308=
Y1309=
Y1310=
Y1311=
Y1312=
Y1313=
Y1314=
Y1315=
Y1316=
Y1317=
Y1318=
Y1319=
Y1320=
Y1321=
Y1322=
Y1323=
Y1324=
Y1325=
Y1326=
Y1327=
Y1328=
Y1329=
Y1330=
Y1331=
Y1332=
Y1333=
Y1334=
Y1335=
Y1336=
Y1337=
Y1338=
Y1339=
Y1340=
Y1341=
Y1342=
Y1343=
Y1344=
Y1345=
Y1346=
Y1347=
Y1348=
Y1349=
Y1350=
Y1351=
Y1352=
Y1353=
Y1354=
Y1355=
Y1356=
Y1357=
Y1358=
Y1359=
Y1360=
Y1361=
Y1362=
Y1363=
Y1364=
Y1365=
Y1366=
Y1367=
Y1368=
Y1369=
Y1370=
Y1371=
Y1372=
Y1373=
Y1374=
Y1375=
Y1376=
Y1377=
Y1378=
Y1379=
Y1380=
Y1381=
Y1382=
Y1383=
Y1384=
Y1385=
Y1386=
Y1387=
Y1388=
Y1389=
Y1390=
Y1391=
Y1392=
Y1393=
Y1394=
Y1395=
Y1396=
Y1397=
Y1398=
Y1399=
Y1400=
Y1401=
Y1402=
Y1403=
Y1404=
Y1405=
Y1406=
Y1407=
Y1408=
Y1409=
Y1410=
Y1411=
Y1412=
Y1413=
Y1414=
Y1415=
Y1416=
Y1417=
Y1418=
Y1419=
Y1420=
Y1421=
Y1422=
Y1423=
Y1424=
Y1425=
Y1426=
Y1427=
Y1428=
Y1429=
Y1430=
Y1431=
Y1432=
Y1433=
Y1434=
Y1435=
Y1436=
Y1437=
Y1438=
Y1439=
Y1440=
Y1441=
Y1442=
Y1443=
Y1444=
Y1445=
Y1446=
Y1447=
Y1448=
Y1449=
Y1450=
Y1451=
Y1452=
Y1453=
Y1454=
Y1455=
Y1456=
Y1457=
Y1458=
Y1459=
Y1460=
Y1461=
Y1462=
Y1463=
Y1464=
Y1465=
Y1466=
Y1467=
Y1468=
Y1469=
Y1470=
Y1471=
Y1472=
Y1473=
Y1474=
Y1475=
Y1476=
Y1477=
Y1478=
Y1479=
Y1480=
Y1481=
Y1482=
Y1483=
Y1484=
Y1485=
Y1486=
Y1487=
Y1488=
Y1489=
Y1490=
Y1491=
Y1492=
Y1493=
Y1494=
Y1495=
Y1496=
Y1497=
Y1498=
Y1499=
Y1500=
Y1501=
Y1502=
Y1503=
Y1504=
Y1505=
Y1506=
Y1507=
Y1508=
Y1509=
Y1510=
Y1511=
Y1512=
Y1513=
Y1514=
Y1515=
Y1516=
Y1517=
Y1518=
Y1519=
Y1520=
Y1521=
Y1522=
Y1523=
Y1524=
Y1525=
Y1526=
Y1527=
Y1528=
Y1529=
Y1530=
Y1531=
Y1532=
Y1533=
Y1534=
Y1535=
Y1536=
Y1537=
Y1538=
Y1539=
Y1540=
Y1541=
Y1542=
Y1543=
Y1544=
Y1545=
Y1546=
Y1547=
Y1548=
Y1549=
Y1550