fnsdeg2

Fonctions du second degré

Calculatrices : 89 92 92+ V200
Niveaux : 1ere S Tale Tale S
Descriptif : Groupe de programmes – Permet l'étude complète des fonctions polynômes du second degré
Mots-clefs : fonctions, polynômes
Auteur : François Texier
Date de dernière révision : Septembre 2002

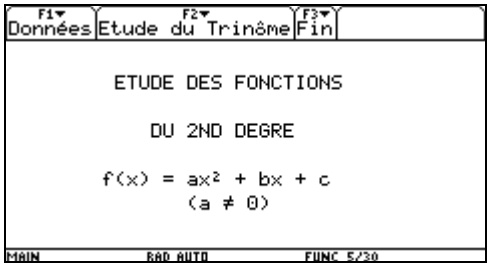
Présentation :

Il s'agit d'un groupe de programmes, dont le programme principal est nommé *fnsdeg2*, qui rassemble tout ce qui est nécessaire à l'étude des fonctions polynomiales du second degré.

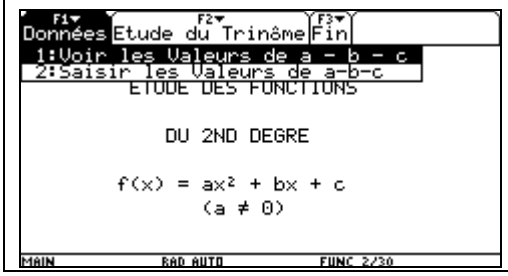
Mode d'emploi :

Il suffit de se placer dans le répertoire dans lequel vous avez copié les fichiers, puis de taper `fnsdeg2()`.

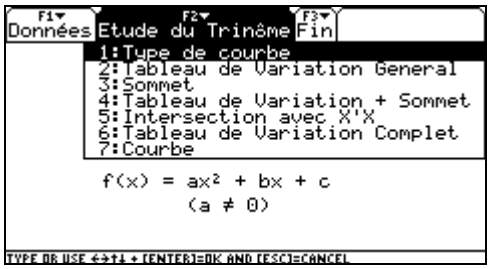
Alors l'écran suivant apparaît :



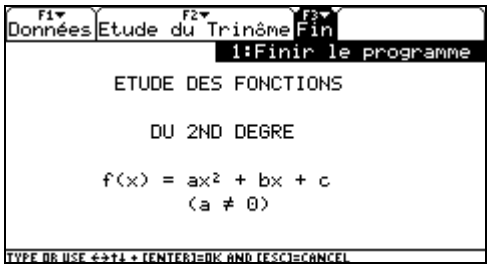
La touche F1 permet de revoir les valeurs de a, b et c précédemment saisies ou de faire la saisie des nouvelles valeurs de a, b et c :



L'étude de ces fonctions du second degré permet, grâce au menu F2 ci-dessous, de visualiser tous les éléments généraux ou particuliers aux valeurs de a, b et c saisies, aussi bien du point de vue des valeurs numériques caractéristiques, que des tableaux de variations ou des graphiques :



Le menu F3 permet de quitter le programme et de revenir à l'écran principal :



Au niveau des graphiques, les axes ne sont pas gradués mais il est toujours possible, une fois sorti du programme, de visualiser les valeurs de la fenêtre d'affichage.

<u>Remarque</u>: Attention, les valeurs des coefficients a, b et c peuvent être modifiés entre deux utilisations du programme si on enregistre des valeurs dans les variables a, b et c, c'est pourquoi la première option du menu F1 permet de visualiser quelles sont les valeurs de a, b et c.

<u>Sources :</u>

Version 89

Dans le répertoire *fnsdeg2* :

```
Tabl11 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz 0
LineHorz ⁻20
```

```
LineHorz ¯62
LineVert 0
LineVert 11
LineVert 126
PtText "x",3,¯9
PtText "y",3,¯37
PtText "-∞",12,¯9
PtText "+∞",115,¯9
PtText " -b",60,¯4
Line 63,¯11,76,¯11
PtText " 2a",60,¯13
Line 20,¯55,54,¯28
Line 50,¯28,54,¯28
Line 54,¯31,54,¯28
Line 84,¯28,116,¯54
Line 112,¯54,116,¯54
Line 116,¯51,116,¯54
PtText "-∞",12,¯55.5
PtText "-∞",115,¯55.5
PtText "y max",57,¯25
Pause
EndPrgm

Tabl21 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
¯62→ymin:0→ymax:0→yscl:1→xres
LineHorz 0
LineHorz ¯20
LineHorz ¯62
LineVert 0
LineVert 11
LineVert 126
PtText "x",3,¯9
PtText "y",3,¯37
PtText "-∞",12,¯9
PtText "+∞",115,¯9
PtText " -b",60,¯4
Line 63,¯11,76,¯11
PtText " 2a",60,¯13
Line 20,¯28,54,¯55
Line 50,¯55,54,¯55
Line 54,¯52,54,¯55
Line 84,¯54,116,¯28
Line 112,¯28,116,¯28
Line 116,¯31,116,¯28
PtText "+∞",12,¯22
PtText "+∞",115,¯22
PtText "y min",57,¯55
Pause
EndPrgm

Tabl22 ()
```

```
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz 0
LineHorz ⁻20
LineHorz ⁻62
LineVert 0
LineVert 11
LineVert 126
PtText "x",3,⁻9
PtText "y",3,⁻37
PtText "-∞",12,⁻9
PtText "+∞",115,⁻9
PtText string(m),55,⁻9
Line 20,⁻28,54,⁻55
Line 50,⁻55,54,⁻55
Line 54,⁻52,54,⁻55
Line 84,⁻54,116,⁻28
Line 112,⁻28,116,⁻28
Line 116,⁻31,116,⁻28
PtText "+∞",12,⁻22
PtText "+∞",115,⁻22
PtText string(n),57,⁻55
Pause
EndPrgm
```

Tabl23 ()

```
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz 0
LineHorz ⁻20
LineHorz ⁻62
LineVert 0
LineVert 11
LineVert 126
PtText "x",3,⁻9
PtText "y",3,⁻37
PtText "-∞",12,⁻9
PtText "+∞",115,⁻9
PtText string(m),55,⁻9
Line 20,⁻28,54,⁻55
Line 50,⁻55,54,⁻55
Line 54,⁻52,54,⁻55
Line 84,⁻54,116,⁻28
Line 112,⁻28,116,⁻28
Line 116,⁻31,116,⁻28
PtText "+∞",12,⁻22
PtText "+∞",115,⁻22
PtText string(n),57,⁻55
```

```
If Δ>Ø Then
PtText string(min(x11,x21)),27,¯9
PtText string(max(x11,x21)),9Ø,¯9
PtText "Ø",34,¯38
PtText "Ø",96,¯38
EndIf
Pause
EndPrgm
```

Dans le répertoire *main* :

```
Equa0 ()
Prgm
ClrIO
Output Ø,5,"2 intersections avec X'X"
Output 15,1Ø,"X1="
Output 13,32,X1
Output 4Ø,1Ø,"X2="
Output 38,32,X2
Output 6Ø,1Ø,"Y1= Ø    et    Y2= Ø"
Pause
ClrIO
Output Ø,5,"2 intersections avec X'X"
Output 15,1Ø,"X1="
Output 15,32,X11
Output 4Ø,1Ø,"X2="
Output 4Ø,32,X21
Output 6Ø,1Ø,"Y1= Ø    et    Y2= Ø"
Pause
EndPrgm
```

```
Fnsdeg2 ()
Prgm
ClrGraph
ClrDraw
FnOff
Lbl debut
ClrIO
Disp "    ETUDE DES FONCTIONS"
Disp ""
Disp "       DU 2ND DEGRE"
Disp ""
Disp "   f(x) = ax² + bx + c"
Disp "          (a ≠ Ø)"
ToolBar
Title "Données"
Item "Voir les Valeurs",valeurs
Item "Saisir les Valeurs",saisie
Title "Etude du Trinome"
Item "Type de courbe",courbe1
Item "Tab Var General",tabvarg
Item "Sommet",sommet
Item "Tab Var + Sommet",tabvars
Item "Intersection X'X",intersec
Item "Tab Var Complet",tabvarc
Item "Courbe",courbe2
```

```
Title "Fin"
Item "Fin",fin
EndTBar
Lbl saisie
ClrIO
Disp " f(x) = ax² + bx + c"
Disp "    (a ≠ Ø)"
Prompt a,b,c
If a=Ø Then
Disp ""
Disp "ATTENTION: a ≠ Ø !!"
Disp ""
Pause
Goto saisie
Else
b^2-4a*c→Δ
approx(int(1ØØ(⁻b/(2a)))/1ØØ)→m
approx(int(1ØØ(⁻Δ/(4a)))/1ØØ)→n
If Δ>Ø Then
(⁻b-√(Δ))/(2a)→x1
(⁻b+√(Δ))/(2A)→x2
approx(int(1ØØx1)/1ØØ)→x11
approx(int(1ØØx2)/1ØØ)→x21
EndIf
Goto debut
EndIf
Lbl valeurs
ClrIO
Output 5,3Ø,"f(x) = ax² + bx + c"
Output 15,6Ø,"(a ≠ Ø)"
Output 35,65,"a ="
Output 35,87,a
Output 5Ø,65,"b ="
Output 5Ø,87,b
Output 65,65,"c ="
Output 65,87,c
Output 7Ø,14Ø,">>>"
b^2-4a*c→Δ
approx(int(1ØØ(⁻b/(2a)))/1ØØ)→m
approx(int(1ØØ(⁻Δ/(4a)))/1ØØ)→n
If Δ>Ø Then
(⁻b-√(Δ))/(2a)→x1
(⁻b+√(Δ))/(2a)→x2
approx(int(1ØØx1)/1ØØ)→x11
approx(int(1ØØx2)/1ØØ)→x21
EndIf
Pause
Goto debut
Lbl courbe1
If a<Ø Then
graph1()
Else
graph2()
EndIf
Goto debut
Lbl tabvarg
```

```
If a<Ø Then
tabl11()
Else
tabl21()
EndIf
Goto debut
Lbl sommet
If a<Ø Then
ClrDraw :ClrIO
Output 1,1Ø,"Sommet, Maximum en:"
xtrem()
Else
ClrDraw :ClrIO
Output 1,1Ø,"Sommet, Minimum en:"
xtrem()
EndIf
Goto debut
Lbl tabvars
If a<Ø Then
tabl12()
Else
tabl22()
EndIf
Goto debut
Lbl tabvarc
If a<Ø Then
tabl13()
Else
tabl23()
EndIf
Goto debut
Lbl intersec
ClrDraw :ClrIO
If Δ<Ø Then
Output 1Ø,3Ø,"Ø  intersection"
Output 3Ø,45,"avec  X'X"
Pause
ElseIf Δ=Ø Then
Output 5,3Ø,"1  intersection"
Output 22,45,"avec  X'X"
Output 39,45,"le sommet"
Output 56,3Ø,"de la parabole"
Pause
Else
EQUAØ()
EndIf
goto debut
Lbl courbe2
graphØ()
Goto debut
Lbl fin
DispHome
EndPrgm

Graph0 ()
Prgm
```

```
ClrDraw
FnOff
a*x^2+b*x+c→y21(x)
setGraph("Axes","On")
If Δ>0 Then
min(int(m-4),min(x1,x2)-1)→xmin
max(int(m+4),max(x1,x2)+1)→xmax
Else
int(m-4)→xmin
int(m+4)→xmax
EndIf
If A>0 Then
int(n-1)→ymin
If ymin>0 Then
0→ymin
EndIf
int(y21(xmin)+1)→ymax
Else
int(n+1)→ymax
If ymax<0
Then
0→ymax
EndIf
int(y21(xmin)-1)→ymin
EndIf
0→xscl:0→yscl:1→xres
DispG
Pause
ClrDraw :ClrIO
EndPrgm

Graph1 ()
Prgm
setGraph("Axes","Off")
FnOff :PlotsOff
⁻12.7→xmin:12.7→xmax:0→xscl
⁻40→ymin:5→ymax:0→yscl:1→xres
⁻x^2→y20(x)
DispG
LineHorz 5
LineHorz ⁻40
LineVert ⁻12.7
LineVert 12.7
PtText "A<0",⁻1.5,⁻20
PtText "PARABOLE",⁻12,3
Pause
EndPrgm

Graph2 ()
Prgm
setGraph("Axes","Off")
FnOff :PlotsOff
⁻12.7→xmin:12.7→xmax:0→xscl
⁻5→ymin:40→ymax:0→yscl:1→xres
x^2→y20(x)
DispG
```

```
LineHorz ⁻5
LineHorz 4Ø
LineVert ⁻12.7
LineVert 12.7
PtText "A>Ø",⁻1.5,2Ø
PtText "PARABOLE",⁻12,Ø
Pause
EndPrgm
```

```
Tabl12 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
Ø→xmin:126→xmax:Ø→xscl
⁻62→ymin:Ø→ymax:Ø→yscl:1→xres
LineHorz Ø
LineHorz ⁻2Ø
LineHorz ⁻62
LineVert Ø
LineVert 11
LineVert 126
PtText "x",3,⁻9
PtText "y",3,⁻37
PtText "-∞",12,⁻9
PtText "+∞",115,⁻9
PtText string(m),55,⁻9
Line 2Ø,⁻55,54,⁻28
Line 5Ø,⁻28,54,⁻28
Line 54,⁻31,54,⁻28
Line 84,⁻28,116,⁻54
Line 112,⁻54,116,⁻54
Line 116,⁻51,116,⁻54
PtText "-∞",12,⁻55.5
PtText "-∞",115,⁻55.5
PtText string(n),58,⁻25
Pause
EndPrgm
```

```
Tabl13 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
Ø→xmin:126→xmax:Ø→xscl
⁻62→ymin:Ø→ymax:Ø→yscl:1→xres
LineHorz Ø
LineHorz ⁻2Ø
LineHorz ⁻62
LineVert Ø
LineVert 11
LineVert 126
PtText "x",3,⁻9
PtText "y",3,⁻37
PtText "-∞",12,⁻9
PtText "+∞",115,⁻9
```

```
PtText string(m),55,⁻9
Line 20,⁻55,54,⁻28
Line 50,⁻28,54,⁻28
Line 54,⁻31,54,⁻28
Line 84,⁻28,116,⁻54
Line 112,⁻54,116,⁻54
Line 116,⁻51,116,⁻54
PtText "-∞",12,⁻55.5
PtText "-∞",115,⁻55.5
PtText string(n),58,⁻25
If Δ>0 Then
PtText string(min(x11,x21)),27,⁻9
PtText string(max(x11,x21)),90,⁻9
PtText "0",34,⁻38
PtText "0",93,⁻36
EndIf
Pause
EndPrgm
```

Xtrem ()

```
Prgm
Output 15,10,"x = -b/2a"
Output 40,10,"y = f(-b/2a) = -Δ/4a"
Output 55,10,"Δ = b²-4ac ="
Pause
Output 15,10,"                                "
Output 40,10,"                                "
Output 15,10,"x = "
Output 40,10,"y = "
Output 15,32,⁻b/(2a)
Output 40,32,⁻Δ/(4a)
Output 55,90,Δ
Pause
Output 15,32,"                                "
Output 22,10,"                                "
Output 25,10,"                                "
Output 30,10,"                                "
Output 40,32,"                                "
Output 15,32,m
Output 40,32,n
Pause
EndPrgm
```

Version 92, 92+ et V200 :

Tabl21 ()

```
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz  0
LineHorz  ⁻20
LineHorz  ⁻62
```

```
LineVert  Ø
LineVert  11
LineVert  126
PtText  "x",3,⁻9
PtText  "y",3,⁻37
PtText  "-∞",12,⁻9
PtText  "+∞",115,⁻9
PtText  " -b",6Ø,⁻4
Line  6Ø,⁻11,73,⁻11
PtText  " 2a",6Ø,⁻13
Line  2Ø,⁻28,54,⁻55
Line  5Ø,⁻55,54,⁻55
Line  54,⁻52,54,⁻55
Line  84,⁻54,116,⁻28
Line  112,⁻28,116,⁻28
Line  116,⁻31,116,⁻28
PtText  "+∞",12,⁻22
PtText  "+∞",115,⁻22
PtText  "y min",57,⁻55
Pause
EndPrgm
```

```
Tabl22 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
Ø→xmin:126→xmax:Ø→xscl
⁻62→ymin:Ø→ymax:Ø→yscl:1→xres
LineHorz  Ø
LineHorz  ⁻2Ø
LineHorz  ⁻62
LineVert  Ø
LineVert  11
LineVert  126
PtText  "x",3,⁻9
PtText  "y",3,⁻37
PtText  "-∞",12,⁻9
PtText  "+∞",115,⁻9
PtText  string(m),55,⁻9
Line  2Ø,⁻28,54,⁻55
Line  5Ø,⁻55,54,⁻55
Line  54,⁻52,54,⁻55
Line  84,⁻54,116,⁻28
Line  112,⁻28,116,⁻28
Line  116,⁻31,116,⁻28
PtText  "+∞",12,⁻22
PtText  "+∞",115,⁻22
PtText  string(n),57,⁻55
Pause
EndPrgm
```

```
Tabl11 ()
Prgm
ClrDraw
setGraph("Axes","Off")
```

```
FnOff
Ø→xmin:126→xmax:Ø→xscl
¯62→ymin:Ø→ymax:Ø→yscl:1→xres
LineHorz Ø
LineHorz ¯2Ø
LineHorz ¯62
LineVert Ø
LineVert 11
LineVert 126
PtText "x",3,¯9
PtText "y",3,¯37
PtText "-∞",12,¯9
PtText "+∞",115,¯9
PtText " -b",6Ø,¯4
Line 6Ø,¯11,73,¯11
PtText " 2a",6Ø,¯13
Line 2Ø,¯55,54,¯28
Line 5Ø,¯28,54,¯28
Line 54,¯31,54,¯28
Line 84,¯28,116,¯54
Line 112,¯54,116,¯54
Line 116,¯51,116,¯54
PtText "-∞",12,¯55.5
PtText "-∞",115,¯55.5
PtText "y max",57,¯25
Pause
EndPrgm
```

Tabl12 ()

```
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
Ø→xmin:126→xmax:Ø→xscl
¯62→ymin:Ø→ymax:Ø→yscl:1→xres
LineHorz Ø
LineHorz ¯2Ø
LineHorz ¯62
LineVert Ø
LineVert 11
LineVert 126
PtText "x",3,¯9
PtText "y",3,¯37
PtText "-∞",12,¯9
PtText "+∞",115,¯9
PtText string(m),55,¯9
Line 2Ø,¯55,54,¯28
Line 5Ø,¯28,54,¯28
Line 54,¯31,54,¯28
Line 84,¯28,116,¯54
Line 112,¯54,116,¯54
Line 116,¯51,116,¯54
PtText "-∞",12,¯55.5
PtText "-∞",115,¯55.5
PtText string(n),58,¯25
Pause
```

```
EndPrgm

Tabl23 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz  0
LineHorz  ⁻20
LineHorz  ⁻62
LineVert  0
LineVert  11
LineVert  126
PtText  "x",3,⁻9
PtText  "y",3,⁻37
PtText  "-∞",12,⁻9
PtText  "+∞",115,⁻9
PtText  string(m),55,⁻9
Line  20,⁻28,54,⁻55
Line  50,⁻55,54,⁻55
Line  54,⁻52,54,⁻55
Line  84,⁻54,116,⁻28
Line  112,⁻28,116,⁻28
Line  116,⁻31,116,⁻28
PtText  "+∞",12,⁻22
PtText  "+∞",115,⁻22
PtText  string(n),57,⁻55
If Δ>0 Then
PtText  string(min(x11,x21)),27,⁻9
PtText  string(max(x11,x21)),90,⁻9
PtText  "0",34,⁻38
PtText  "0",98,⁻39
EndIf
Pause
EndPrgm

Tabl13 ()
Prgm
ClrDraw
setGraph("Axes","Off")
FnOff
0→xmin:126→xmax:0→xscl
⁻62→ymin:0→ymax:0→yscl:1→xres
LineHorz 0
LineHorz ⁻20
LineHorz ⁻62
LineVert 0
LineVert 11
LineVert 126
PtText "x",3,⁻9
PtText "y",3,⁻37
PtText "-∞",12,⁻9
PtText "+∞",115,⁻9
PtText string(m),55,⁻9
```

```
Line 20,⁻55,54,⁻28
Line 50,⁻28,54,⁻28
Line 54,⁻31,54,⁻28
Line 84,⁻28,116,⁻54
Line 112,⁻54,116,⁻54
Line 116,⁻51,116,⁻54
PtText "-∞",12,⁻55.5
PtText "-∞",115,⁻55.5
PtText string(n),58,⁻25
If Δ>0 Then
PtText string(min(x11,x21)),27,⁻9
PtText string(max(x11,x21)),90,⁻9
PtText "0",35,⁻39
PtText "0",97,⁻38
EndIf
Pause
EndPrgm
```

Graph2 ()

```
Prgm
setGraph("Axes","Off")
FnOff  :PlotsOff
⁻12.7→xmin:12.7→xmax:0→xscl
⁻5→ymin:40→ymax:0→yscl:1→xres
x^2→y20(x)
DispG
LineHorz  ⁻5
LineHorz  40
LineVert  ⁻12.7
LineVert  12.7
PtText  "A>0",⁻1.5,20
PtText  "PARABOLE",⁻12,0
Pause
EndPrgm
```

Xtrem ()

```
Prgm
Output  15,10,"x = -b/2a"
Output  40,10,"y = f(-b/2a) = -Δ/4a"
Output  55,10,"Δ = b²-4ac ="
Pause
Output  15,10,"                              "
Output  40,10,"                              "
Output  15,10,"x = "
Output  40,10,"y = "
Output  15,32,⁻b/(2*a)
Output  40,32,⁻Δ/(4*a)
Output  55,90,Δ
Pause
Output  15,32,"                              "
Output  22,10,"                              "
Output  25,10,"                              "
Output  30,10,"                              "
Output  40,32,"                              "
Output  15,32,m
Output  40,32,n
```

```
Pause
EndPrgm

Equa0 ()
Prgm
ClrIO
Output  Ø,5,"2 intersections avec X'X"
Output  15,1Ø,"X1="
Output  13,32,x1
Output  4Ø,1Ø,"X2="
Output  38,32,x2
Output  6Ø,1Ø,"Y1= Ø    et    Y2= Ø"
Pause
ClrIO
Output  Ø,5,"2 intersections avec X'X"
Output  15,1Ø,"X1="
Output  15,32,x11
Output  4Ø,1Ø,"X2="
Output  4Ø,32,x21
Output  6Ø,1Ø,"Y1= Ø    et    Y2= Ø"
Pause
EndPrgm

Fnsdeg2 ()
Prgm
ClrGraph
ClrDraw
FnOff
Lbl  debut
ClrIO
Disp  ""
Disp  "         ETUDE DES FONCTIONS"
Disp  ""
Disp  "            DU 2ND DEGRE"
Disp  ""
Disp  "        f(x) = ax² + bx + c"
Disp  "               (a ≠ Ø)"
Toolbar
Title  "Données"
Item  "Voir les Valeurs de a - b - c",valeurs
Item  "Saisir les Valeurs de a-b-c",saisie
Title  "Etude du Trinôme"
Item  "Type de courbe",courbe1
Item  "Tableau de Variation General",tabvarg
Item  "Sommet",sommet
Item  "Tableau de Variation + Sommet",tabvars
Item  "Intersection avec X'X",intersec
Item  "Tableau de Variation Complet",tabvarc
Item  "Courbe",courbe2
Title  "Fin"
Item  "Finir le programme",fin
EndTBar
Lbl  saisie
ClrIO
Disp  ""
Disp  " f(x) = ax² + bx + c"
```

```
Disp  "    (a ≠ Ø)"
Prompt  a,b,c
If a=Ø Then
Disp  ""
Disp  "ATTENTION: a ≠ Ø !!"
Disp  ""
Pause
Goto  saisie
Else
b^2-4*a*c→Δ
approx(int(1ØØ*(⁻b/(2*a)))/1ØØ)→m
approx(int(1ØØ*(⁻Δ/(4*a)))/1ØØ)→n
If Δ>Ø Then
(⁻b-√(Δ))/(2*a)→x1
(⁻b+√(Δ))/(2*a)→x2
approx(int(1ØØ*x1)/1ØØ)→x11
approx(int(1ØØ*x2)/1ØØ)→x21
EndIf
Goto  debut
EndIf
Lbl  valeurs
ClrIO
Output  5,6Ø,"f(x) = ax² + bx + c"
Output  15,9Ø,"(a ≠ Ø)"
Output  3Ø,95,"a ="
Output  3Ø,117,a
Output  45,95,"b ="
Output  45,117,b
Output  6Ø,95,"c ="
Output  6Ø,117,c
Output  9Ø,22Ø,">>>"
b^2-4*a*c→Δ
approx(int(1ØØ*(⁻b/(2*a)))/1ØØ)→m
approx(int(1ØØ*(⁻Δ/(4*a)))/1ØØ)→n
If Δ>Ø Then
(⁻b-√(Δ))/(2*a)→x1
(⁻b+√(Δ))/(2*a)→x2
approx(int(1ØØ*x1)/1ØØ)→x11
approx(int(1ØØ*x2)/1ØØ)→x21
EndIf
Pause
Goto  debut
Lbl  courbe1
If a<Ø Then
graph1()
Else
graph2()
EndIf
Goto  debut
Lbl  tabvarg
If a<Ø Then
tabl11()
Else
tabl21()
EndIf
Goto  debut
```

```
Lbl  sommet
If a<Ø Then
ClrDraw:ClrIO
Output  1,1Ø,"Sommet, Maximum en:"
xtrem()
Else
ClrDraw:ClrIO
Output  1,1Ø,"Sommet, Minimum en:"
xtrem()
EndIf
Goto  debut
Lbl  tabvars
If a<Ø Then
tabl12()
Else
tabl22()
EndIf
Goto  debut
Lbl  tabvarc
If a<Ø Then
tabl13()
Else
tabl23()
EndIf
Goto  debut
Lbl  intersec
ClrDraw:ClrIO
If Δ<Ø Then
Output  1Ø,3Ø,"Ø  intersection"
Output  3Ø,45,"avec  X'X"
Pause
ElseIf Δ=Ø Then
Output  5,3Ø,"1  intersection"
Output  22,45,"avec  X'X"
Output  39,45,"le sommet"
Output  56,3Ø,"de la parabole"
Pause
Else
equaØ()
EndIf
Goto  debut
Lbl  courbe2
graphØ()
Goto  debut
Lbl  fin
DispHome
EndPrgm
```

Graph0 ()

```
Prgm
ClrDraw
FnOff
a*x^2+b*x+c→y21(x)
setGraph("Axes","On")
If Δ>Ø Then
min(int(m-4),min(x1,x2)-1)→xmin
```

```
max(int(m+4),max(x1,x2)+1)→xmax
Else
int(m-4)→xmin
int(m+4)→xmax
EndIf
If a>Ø Then
int(n-1)→ymin
If ymin>Ø Then
Ø→ymin
EndIf
int(y21(xmin)+1)→ymax
Else
int(n+1)→ymax
If ymax<Ø Then
Ø→ymax
EndIf
int(y21(xmin)-1)→ymin
EndIf
Ø→xscl:Ø→yscl:1→xres
DispG
Pause
ClrDraw:ClrIO
EndPrgm
```

```
Graph1 ()
Prgm
setGraph("Axes","Off")
FnOff :PlotsOff
¯12.7→xmin:12.7→xmax:Ø→xscl
¯4Ø→ymin:5→ymax:Ø→yscl:1→xres
¯x^2→y2Ø(x)
DispG
LineHorz 5
LineHorz ¯4Ø
LineVert ¯12.7
LineVert 12.7
PtText "A<Ø",¯1.5,¯2Ø
PtText "PARABOLE",¯12,3
Pause
EndPrgm
```