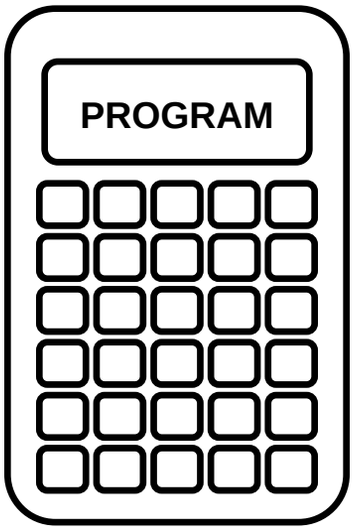
CASIO fx-50FH II



S5 PROGRAM LIBRARY

中五計算機程式・精選版

7 tested programs · 5 memory-safe packs · 680-byte aware

Program 01 **一元二次方程：頂點與極值**
Quadratic: Vertex, Optimum and Roots

Program 02 **聯立二元一次方程**
Simultaneous Linear Equations in Two Unknowns

Program 03 **一元三次方程**
Cubic Equations

Program 04 **圓心及半徑**
Centre and Radius of a Circle

Program 05 **直線與圓的交點**
Intersection Points of a Straight Line and a Circle

Program 06 **三點定圓**
Centre, Radius and Equation from Three Given Points

Program 07 **三角形四心**
Centres of a Triangle

Program 08 **複數聯立方程**
Simultaneous Equations (Complex)

Program 09 **直線與圓的交點（複數）**
Intersections of a Line and a Circle (Complex)

Program 10 **二元二次方程組（複數）**
Simultaneous Equations (Quadratic, Complex)

Program 11 **兩條二次曲線的交點（複數）**
Intersections of Two Quadratic Curves (Complex)

Program 12 **聯立方程 + 直線與圓（二合一）**
Simultaneous Equations and Line-Circle (Combined)

Built from the canonical tested web catalog · Revised 18 October 2026

PRGM Command Reference

程式模式按鍵速查

Command	Physical keys	Command	Physical keys
?	SHIFT 3 1	ClrMemory	SHIFT 9 1
: / new line	SHIFT 3 3 or EXE	ClrStat	SHIFT 9 1
◢ output	SHIFT 3 4	Goto	SHIFT 3 □ □ □ 1
→ assign	SHIFT 3 2	Lbl	SHIFT 3 □ □ □ 2
□	SHIFT 3 □ 1	If	SHIFT 3 □ 1
=	SHIFT 3 □ 2	Then	SHIFT 3 □ 2
≠	SHIFT 3 □ 3	Else	SHIFT 3 □ □ 1
> / <	SHIFT 3 □ □ 1 / 2	IfEnd	SHIFT 3 □ □ 1
≥ / ≤	SHIFT 3 □ □ 3 / 4	While	SHIFT 3 □ □ □ 1
A B C D	ALPHA + letter key	WhileEnd	SHIFT 3 □ □ □ 2
X Y M	ALPHA +) , M+	For / To / Step	SHIFT 3 □ □ □ 1/2/3
Rnd(	SHIFT 0	Next	SHIFT 3 □ □ □ □ 1
Fix / Sci / Norm	SHIFT MODE □ 1/2/3	Abs(	SHIFT)
Pol(/ Rec(	SHIFT + / SHIFT -	DT	M+ in SD/REG

Tip: an ordinary minus sign is accepted in Program Studio; use the physical (-) key for negative input on the calculator.

Program 1

Quadratic: Vertex, Optimum and Roots
一元二次方程：頂點與極值

用法

輸入 a、b、c，即時求出頂點、極值及兩個實根。

INPUT A=a，B=b，C=c

MODE COMP · 61 bytes

OUTPUT 頂點 x、極值、兩個實根

Program steps

```
?→A
?→B
?→C
B²-4AC→D
-B÷(2A)◢
-D÷(4A)◢
(√(D)-B)÷(2A)◢
-B÷A-Ans
```

示範 Example

Solve f(x) = x² + 2x − 15 and describe its graph.

```
TYPE   1  EXE   2  EXE   (-)15  EXE
GET    -1      vertex x-coordinate (h)
       -16     minimum value (k)
       3       first root
       -5      second root

NOTE   The second root appears when the program finishes; press EXE once
       more if the display is still showing the first root. If Math ERROR
       appears at the first root, b² - 4ac < 0 and the roots are not real.
```

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 2

Simultaneous Linear Equations in Two Unknowns
聯立二元一次方程

用法

輸入兩條直線方程的六個係數，即時求出交點。

INPUT A,B,C 及 D,X,Y（Ax+By=C、Dx+Xy=Y）

MODE COMP · 51 bytes

OUTPUT x、y

Program steps

```
?→A
?→B
?→C
?→D
?→X
?→Y
(XC-BY)÷(XA-BD)→M◢
C÷B-AM÷B
```

示範 Example

Solve x + y = 1 and 2x - y = 5.

TYPE 1 EXE 1 EXE 1 EXE 2 EXE (-)1 EXE 5 EXE
GET 2 x
-1 y

NOTE The six values are read as A, B, C, D, X, Y. Put the constant of each equation on the right-hand side before you start. If the determinant XA - BD is zero the lines are parallel or identical, and Math ERROR is shown.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 3

Cubic Equations
一元三次方程

用法

毋須先猜因式，直接求一元三次方程的所有實根。

INPUT A,B,C,M 為 $Ax^3+Bx^2+Cx+M=0$ 的係數

MODE COMP · 273 bytes

OUTPUT 所有不同實根

Program steps

```
?→A
?→B
?→C
?→M
2×B³÷(27×A³)-B×C÷(3×A²)+M÷A→D
C÷A-B²÷(3×A²)→X
B÷(3×A)→Y
(D÷2)²+(X÷3)³→M
M<0⇒Goto 1
M=0⇒Goto 2
∜((-D÷2+√(M)))+∜((-D÷2-√(M)))-Y◢
Goto 9
Lbl 2
∜((-D÷2))→A
2×A-Y◢
A=0⇒Goto 9
-A-Y◢
Goto 9
Lbl 1
Deg
cos⁻¹((3×D÷(2×X))×√((-3÷X)))÷3→M
2×√((-X÷3))→A
A×cos(M)-Y◢
A×cos(M - 120)-Y◢
A×cos(M - 240)-Y◢
Lbl 9
```

示範 Example

Factorise $x^3 + 6x^2 + 11x + 6 = 0$.

TYPE 1 EXE 6 EXE 11 EXE 6 EXE
GET -1, -2, -3 the three roots

so $x^3 + 6x^2 + 11x + 6 = (x + 1)(x + 2)(x + 3)$.

NOTE Three pauses means three distinct real roots. One pause means one real root and a complex conjugate pair, which this program does not print.
A repeated root is printed once. Example: 2, 7, 5, 1 gives -0.5, -0.382 and -2.62.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 4

Centre and Radius of a Circle
圓心及半徑

用法

由圓的一般式係數，即時求出圓心及半徑。

INPUT A,B,C 為 $x^2+y^2+Cx+By+A=0$ 的係數

MODE COMP · 38 bytes

OUTPUT 圓心坐標、半徑

Program steps

```
?→A
?→B
?→C
-A÷2→X◢
-B÷2→Y◢
√(X²+Y²-C)
```

示範 Example

Find the centre and radius of $x^2 + y^2 + 4x - 8y + 3 = 0$.

```
TYPE   4  EXE   (-)8  EXE   3  EXE
GET    -2          x-coordinate of the centre
       4           y-coordinate of the centre
       4.123105626  radius = √17

NOTE   The radius appears when the program finishes. Math ERROR at that step
       means x² + y² + Cx + By + A = 0 is not a real circle.
```

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 5

Intersection Points of a Straight Line and a Circle
直線與圓的交點

用法

把直線代入圓方程，求出兩個交點坐標。

INPUT 直線 D,X,Y；圓 C,B,A

MODE COMP · 201 bytes

OUTPUT x□, y□, x□, y□

Program steps

```
?→D
?→X
?→Y
?→C
?→B
?→A
X=0□Goto 1
Y²+CDY+AD²→A
-2XY-CDX+BD²→B
D²+X²→M
(-B-√(B²-4AM))÷(2M)→C
(Y-CX)÷D◢
C◢
(-B+√(B²-4AM))÷(2M)→C
(Y-CX)÷D◢
C◢
Goto 2
Lbl 1
Y÷D→X◢
C²-4(X²+BX+A)→M
(-C+√(M))÷2◢
X◢
(-C-√(M))÷2◢
Lbl 2
```

示範 Example

Where does x + 7y = 40 meet x² + y² - 2x - 4y - 20 = 0?

TYPE 1 EXE 7 EXE 40 EXE (-)2 EXE (-)4 EXE (-)20 EXE
GET 5, 5 first intersection point
-2, 6 second intersection point

A vertical line also works: x = 4 and x² + y² - 6x - 6y + 8 = 0
(TYPE 1, 0, 4, -6, -6, 8) gives (4, 6) and (4, 0).

NOTE Input order is the line first, then the circle. A line that misses the circle gives Math ERROR because the discriminant is negative.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 6

Centre, Radius and Equation from Three Given Points
三點定圓

用法

由三個不共線點求圓心、半徑及圓方程。

INPUT 六個坐標 x□,y□,x□,y□,x□,y□

OUTPUT 圓心、半徑、一般式三個係數

MODE COMP · 166 bytes

Program steps

```
?→A
?→B
?→C
?→D
?→X
?→Y
C-A→C
D-B→D
X-A→X
Y-B→Y
(C(X²+Y²)-X(C²+D²))÷2÷(CY-DX)→M
((C²+D²)Y-(X²+Y²)D)÷2÷(CY-DX)→C
A+C→X
B+M→Y
X◢Y◢
√((X-A)²+(Y-B)²)→M◢
-2X◢-2Y◢
X²+Y²-M²
```

示範 Example

Find the circle through (5, 2), (2, 3) and (6, -5).

```
TYPE   5  EXE   2  EXE   2  EXE   3  EXE   6  EXE   (-)5  EXE
GET    2, -2        centre (h, k)
       5            radius
       -4, 4, -17   the equation x² + y² - 4x + 4y - 17 = 0

NOTE   Enter the six coordinates in point order. Collinear points give
       Math ERROR because no circle passes through them.
```

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 7

Centres of a Triangle
三角形四心

用法

輸入三個頂點坐標，求形心、內心、垂心及外心。

INPUT REG 模式；三個頂點坐標 MODE REG · 385 bytes

OUTPUT G、I、H、O 四組坐標

Program steps

```
ClrStat
?→A
?→B
A,B DT
?→C
?→D
C,D DT
?→X
?→Y
X,Y DT
Σx÷3◢
Σy÷3◢
√((C-X)²+(D-Y)²)+√((X-A)²+(Y-B)²)+√((A-C)²+(B-D)²)→M
(√((C-X)²+(D-Y)²)×A+√((X-A)²+(Y-B)²)×C+√((A-C)²+(B-D)²)×X)÷M◢
(√((C-X)²+(D-Y)²)×B+√((X-A)²+(Y-B)²)×D+√((A-C)²+(B-D)²)×Y)÷M◢
2×(A×(D-Y)+C×(Y-B)+X×(B-D))→M
Pol(((A²+B²)×(D-Y)+(C²+D²)×(Y-B)+(X²+Y²)×(B-D))÷M,((A²+B²)×(X-C)+(C²+D²)×(A-X)+(X²+Y²)×(C-A))÷M)
Rec(X,Y)
Σx-2X◢
Σy-2Y◢
X◢
Y◢
```

示範 Example

Take the triangle with vertices O(0, 0), A(24, 0) and B(12, 9).

```
TYPE   0  EXE   0  EXE   24  EXE   0  EXE   12  EXE   9  EXE
GET    12, 3      centroid G
       12, 4      incentre I
       12, 16     orthocentre H
       12, -3.5   circumcentre O

NOTE   This program runs in REG mode and reads the vertices in input order.
       If Math ERROR appears, enter the origin first, then the other two
       vertices: 0, 0, 6, 0, 0, 6 gives G(2, 2), I(1.757, 1.757), H(0, 0), O(3, 3).
```

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 8

Simultaneous Equations (Complex)

複數聯立方程

用法

求係數或答案為複數的二元一次方程組。

INPUT CMPLX 模式；A,B,C 及 D,X,Y 可為 a+bi

MODE CMPLX · 51 bytes

OUTPUT x、y（複數；按 Re⇔Im 看虛部）

Program steps

```
?→A
?→B
?→C
?→D
?→X
?→Y
(XC-BY)÷(XA-BD)→M◢
C÷B-AM÷B
```

示範 Example

Solve (1 + i)x + y = 2 and x − y = i.

```
TYPE   1+i  EXE   1  EXE   2  EXE   1  EXE   (-)1  EXE   i  EXE
GET    1      x — a real number, so Re⇔Im shows 0
       1      y, real part
       -1     y, imaginary part (press SHIFT EXE)

NOTE   Run the program in CMPLX mode — i is ALPHA ENG. Every coefficient may
       be real or complex, and either answer may be complex. At a paused
       answer, SHIFT EXE turns the display over to the imaginary part.
       A zero determinant XA - BD gives Math ERROR.
```

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 9

Intersections of a Line and a Circle (Complex)
直線與圓的交點（複數）

用法

直線與圓沒有實交點時，求出複數共軛交點。

INPUT CMPLX 模式；直線 D,X,Y；圓 C,B,A — MODE CMPLX · 201 bytes

OUTPUT x□, y□, x□, y□（可為複數）

Program steps

```
?→D
?→X
?→Y
?→C
?→B
?→A
X=0⊿Goto 1
Y²+CDY+AD²→A
-2XY-CDX+BD²→B
D²+X²→M
(-B-√(B²-4AM))÷(2M)→C
(Y-CX)÷D◢
C◢
(-B+√(B²-4AM))÷(2M)→C
(Y-CX)÷D◢
C◢
Goto 2
Lbl 1
Y÷D→X◢
C²-4(X²+BX+A)→M
(-C+√(M))÷2◢
X◢
(-C-√(M))÷2◢
Lbl 2
```

示範 Example

Where does x + y = 10 meet x² + y² = 25?

```
TYPE   1  EXE   1  EXE   10  EXE   0  EXE   0  EXE   (-)25  EXE
GET    5 + 3.535533906i   x1
       5 - 3.535533906i   y1
       5 - 3.535533906i   x2
       5 + 3.535533906i   y2
```

NOTE The line misses the circle, so the intersections are a complex conjugate pair. Each answer shows its real part first; SHIFT EXE shows the imaginary part. A line that does meet the circle prints real numbers exactly as the real line-circle program does: 1, 7, 40, -2, -4, -20 gives (5, 5) and (-2, 6).

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 10

Simultaneous Equations (Quadratic, Complex)
二元二次方程組（複數）

用法

解直線與曲線（或兩條曲線）的聯立方程，無實交點時出複數。

INPUT CMPLX 模式；y=Ax²+Bx+C 及 y=Dx²+Xx+Y（直線取 D=0）

MODE CMPLX · 111 bytes

OUTPUT x□, y□, x□, y□（可為複數）

Program steps

```
?→A
?→B
?→C
?→D
?→X
?→Y
A-D→D
B-X→X
C-Y→M
(-X-√(X²-4DM))÷(2D)→Y
Y◢
A Y²+B Y+C◢
(-X+√(X²-4DM))÷(2D)→Y
Y◢
A Y²+B Y+C◢
```

示範 Example

Where do y = x² + 2x + 3 and y = x meet?

```
TYPE   1  EXE   2  EXE   3  EXE   0  EXE   1  EXE   0  EXE
GET    -0.5 - 1.658312395i   x1
       -0.5 - 1.658312395i   y1
       -0.5 + 1.658312395i   x2
       -0.5 + 1.658312395i   y2
```

NOTE The line misses the parabola, so the intersection points are a complex conjugate pair; SHIFT EXE shows each imaginary part. A line that does meet the curve gives real answers: y = x² and y = 2x + 3 (1, 0, 0, 0, 2, 3) gives (-1, 1) and (3, 9). Set D = 0 for a straight line. A must differ from D.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 11

Intersections of Two Quadratic Curves (Complex)
兩條二次曲線的交點（複數）

用法

兩圓或同形二次曲線的交點；無實交點時出複數共軛。

INPUT CMPLX 模式；p,c□,d□,e□ 及 c□,d□,e□ MODE CMPLX · 249 bytes

OUTPUT x□, y□, x□, y□（可為複數）

Program steps

```
?→A
?→B
?→C
?→D
?→X
?→Y
?→M
B-X→X
C-Y→Y
D-M→M
Y=0⇒Goto 1
-X÷Y→X
-M÷Y→M
A×M²+D+C×M→D
M×2×A×X+C×X+B→B
1+A×X²→Y
B²-4×Y×D→A
(-B-√(A))÷(2×Y)→C◢
X×C+M◢
(-B+√(A))÷(2×Y)→C◢
X×C+M◢
Goto 2
Lbl 1
-M÷X→M
M²+D+B×M→D
M◢
C²-4×A×D→B
(-C-√(B))÷(2×A)◢
M◢
(-C+√(B))÷(2×A)◢
Lbl 2
```

示範 Example

Two circles that never meet: $x^2 + y^2 = 25$ and $x^2 + y^2 - 20x + 91 = 0$.
Normalise both to $x^2 + p\,y^2 + c□x + d□y + e□ = 0$ ($p = 1$ for circles).

```
TYPE   1  EXE   0  EXE   0  EXE   (-)25  EXE   (-)20  EXE   0  EXE   91  EXE
GET    5.8                x□
       0 - 2.939387691i   y□
       5.8                x□
       0 + 2.939387691i   y□
```

NOTE The circles are too far apart, so the two intersection points are a complex conjugate pair; SHIFT EXE shows each imaginary part. Curves that do meet give real answers: $x^2+y^2-4x-6y+9 = 0$ with $x^2+y^2-10x-6y+25 = 0$ (1, -4, -6, 9, -10, -6, 25) gives (2.667, 1.114) and (2.667, 4.886). The two equations must share the same x^2 and y^2 coefficients — divide both by that x^2 coefficient first.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.

Program 12

Simultaneous Equations and Line-Circle (Combined)
聯立方程 + 直線與圓（二合一）

用法

同一程式：模式 1 解二元一次聯立（可複數），模式 2 解直線與圓（可複數）。

INPUT 先入 1 或 2，再入 A,B,C,D,X,Y

MODE CMPLX · 273 bytes

OUTPUT 模式 1：x、y；模式 2：x□,y□,x□,y□

Program steps

```
?→M
?→A
?→B
?→C
?→D
?→X
?→Y
M=2□Goto 2
(X×C-B×Y)÷(X×A-B×D)→M◢
C÷B-A×M÷B
Goto 9
Lbl 2
B=0□Goto 3
A²+B²→M
2×A×C+D×B²-X×A×B→D
C²-X×B×C+Y×B²→X
D²-4×M×X→Y
(-D-√(Y))÷(2×M)→X
X◢
(-A×X-C)÷B◢
(-D+√(Y))÷(2×M)→X
X◢
(-A×X-C)÷B◢
Goto 9
Lbl 3
-C÷A→M
X²-4×(M²+Y+D×M)→D
M◢
(-X-√(D))÷2◢
M◢
(-X+√(D))÷2◢
Lbl 9
```

示範 Example

Mode 1 - simultaneous linear equations (complex allowed):
1 EXE 1 EXE 1 EXE 1 EXE 2 EXE (-)1 EXE 5 EXE
→ x = 2, y = -1 (Ax+By=C and Dx+Xy=Y)

Mode 2 - line Ax + By + C = 0 with circle x² + y² + Dx + Xy + Y = 0:
2 EXE 1 EXE 7 EXE (-)40 EXE (-)2 EXE (-)4 EXE (-)20 EXE
→ (-2, 6) and (5, 5)

NOTE Mode 2 returns complex points when the line misses the circle:
2, 1, 1, -10, 0, 0, -25 gives (5 - 3.535533906i, 5 + 3.535533906i)
and its conjugate. A vertical line has its own branch:
2, 1, 0, -4, -6, -6, 8 gives (4, 0) and (4, 6).
Mode 1 takes a+bi coefficients and answers, exactly like P8.

Paper 1: write the formula, substitution and reasoning. The program is a calculation/checking tool, not a replacement for method marks.