

(1) Quadratic formula for $ax^2 + bx + c = 0$, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

MODE MODE 6 3 4 AC 4 (CMPLX) 2

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	B	(14)	x^2	(15)	–
(16)	4	(17)	A	(18)	C	(19)	→	(20)	D
(21)	▲	(22)	(	(23)	√(	(24)	D	(25))
(26)	–	(27)	B	(28)	)	(29)	↓	(30)	2
(31)	÷	(32)	A	(33)	→	(34)	X	(35)	▲
(36)	-	(37)	Ans	(38)	–	(39)	B	(40)	↓
(41)	A	(42)	→	(43)	Y	(44)	▲	(45)	-
(46)	D	(47)	↓	(48)	4	(49)	÷	(50)	A
(51)	→	(52)	M						

Press MODE 1 (COMP) to exit the programme mode.

Example To solve $2x^2 - 3x + 1 = 0$ and find the minimum of $y = 2x^2 - 3x + 1$

Key sequences	Display	Explanation
Prog P4	A [?] 0	Enter into P4 CMPLX mode
2 EXE -3 EXE 1 EXE	$B^2 - 4AC \rightarrow D$ 1. Disp	Discriminant D = 1
EXE	1. Disp	$x = 1$
EXE	1↓2 Disp	$y = \frac{1}{2}$
EXE	-1↓8	Minimum = $-\frac{1}{8}$

Press MODE 1 (COMP) to exit the programme mode.

Example To solve $-x^2 + x - 3 = 0$ and find the maximum of $y = -x^2 + x - 3$

Key sequences	Display	Explanation
Prog P4	A [?] 2	Enter into P4 CMPLX mode
-1 EXE 1 EXE -3 EXE	$B^2 - 4AC \rightarrow D$ -11. Disp	Discriminant D = -11
EXE	1↓2 Disp	
SHIFT EXE	-1.658312395i	$x = \frac{1}{2} - 1.658312395i$
EXE	0.5 Disp	
SHIFT EXE	1.658312395i	$y = \frac{1}{2} + 1.658312395i$
EXE	-11↓4	Maximum = $-\frac{11}{4}$

Press MODE 1 (COMP) to exit the programme mode.

(2) To solve the simultaneous equations : $\begin{cases} ax + by = c \\ dx + ey = f \end{cases}$

(2.1) Transform the equation into $\begin{cases} x + \frac{b}{a}y = \frac{c}{a} \\ x + \frac{e}{d}y = \frac{f}{d} \end{cases}$

(2.2) Press the following keys: MODE 5 1 (Lin) SHIFT 9 1 EXE AC

(b/a) , (c/a) DT

(e/d) , (f/d) DT

(2.3) Then the solutions are: SHIFT 2 1 ►► 1 a EXE solution of x

SHIFT 2 1 ►► 2 b EXE solution of y

(2.4) Press MODE COMP to return to the normal mode.

Example To solve $\begin{cases} x + 2y = 3 \\ 4x + 5y = 6 \end{cases}$; first transform it into $\begin{cases} x + 2y = 3 \\ x + \frac{5}{4}y = \frac{3}{2} \end{cases}$.

Key sequences	Display	Explanation
MODE 5 1	0.	Enter into REG Lin Mode
SHIFT 9 1 EXE AC	0.	Clear the Stat memory
2 , 3 DT	Line = 1.	
1.25 , 1.5 DT	Line = 2.	
SHIFT 2 1 ►► 1 EXE	a -1.	$x = -1$
SHIFT 2 1 ►► 2 EXE	b 2.	$y = 2$

Press MODE 1 (COMP) to exit the REG Lin mode.

(3) To solve a triangle ABC . ①A.S.A.②A.A.S.③S.S.S.④S.A.S.⑤S.S.A.

MODE MODE 6 3 1 AC 2 2

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?	(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	cos ⁻¹	(14)	-	(43)	1	(16)	→	(17)	D	(18)	:	(19)	Lbl	(20)	0
(21)	:	(22)	?	(23)	→	(24)	M	(25)	:	(26)	M	(27)	=	(28)	1	(29)	⇒	(30)	Goto
(31)	1	(32)	:	(33)	If	(34)	M	(35)	=	(36)	2	(37)	:	(38)	Then	(39)	D	(40)	-
(41)	A	(42)	-	(43)	B	(44)	→	(45)	X	(46)	▲	(47)	B	(48)	→	(49)	A	(50)	:
(51)	C	(52)	→	(53)	B	(54)	:	(55)	X	(56)	→	(57)	C	(58)	:	(59)	Goto	(60)	1
(61)	:	(62)	IfEnd	(63)	:	(64)	If	(65)	M	(66)	=	(67)	3	(68)	3	(69)	Then	(70)	cos ⁻¹
(71)	(	(72)	B	(73)	x ²	(74)	+	(75)	C	(76)	x ²	(77)	-	(78)	A	(79)	x ²	(80))
(81)	÷	(82)	(	(83)	2	(84)	B	(85)	C	(86)	→	(87)	X	(88)	▲	(89)	cos ⁻¹	(90)	(
(91)	C	(92)	-	(93)	B	(94)	cos(	(95)	X	(96)	)	(97)	)	(98)	↓	(99)	A	(100)	→
(101)	Y	(102)	▲	(103)	D	(104)	-	(105)	X	(106)	-	(107)	Y	(108)	▲	(109)	Goto	(110)	9
(111)	:	(112)	IfEnd	(113)	:	(114)	If	(115)	M	(116)	=	(117)	4	(118)	:	(119)	Then	(120)	√(
(121)	A	(122)	x ²	(123)	+	(124)	C	(125)	x ²	(126)	-	(127)	2	(128)	A	(129)	C	(130)	cos(
(131)	B	(132)	→	(133)	X	(134)	▲	(135)	cos ⁻¹	(136)	(	(137)	X	(138)	x ²	(139)	+	(140)	C
(141)	x ²	(142)	-	(143)	A	(144)	x ²	(145)	)	(146)	↓	(147)	(	(148)	2	(149)	C	(150)	X
(151)	→	(152)	Y	(153)	▲	(154)	D	(155)	-	(156)	B	(157)	-	(158)	Y	(159)	▲	(160)	Goto
(161)	9	(162)	:	(163)	IfEnd	(164)	:	(165)	M	(166)	=	(167)	5	(168)	⇒	(169)	Goto	(170)	3
(171)	:	(172)	Goto	(173)	0	(174)	:	(175)	Lbl	(176)	1	(177)	:	(178)	D	(179)	-	(180)	A
(181)	-	(182)	C	(183)	→	(184)	X	(185)	:	(186)	(	(187)	M	(188)	-	(189)	1	(190))
(191)	(	(192)	M	(193)	-	(194)	5	(195)	)	(196)	(	(197)	M	(198)	-	(199)	6	(200))
(201)	=	(202)	0	(203)	⇒	(204)	X	(205)	▲	(206)	B	(207)	sin(	(208)	A	(209)	)	(210)	↓
(211)	sin(	(212)	X	(213)	▲	(214)	B	(215)	sin(	(216)	C	(217)	)	(218)	↓	(219)	sin(	(220)	X
(221)	→	(222)	Y	(223)	:	(224)	(	(225)	M	(226)	-	(227)	1	(228)	)	(229)	(	(230)	M
(231)	-	(232)	2	(233)	)	(234)	=	(235)	0	(236)	⇒	(237)	Y	(238)	▲	(239)	If	(240)	M
(241)	=	(242)	6	(243)	:	(244)	Then	(245)	X	(246)	-	(247)	C	(248)	→	(249)	A	(250)	▲
(251)	Goto	(252)	1	(253)	:	(254)	Else	(255)	Goto	(256)	9	(257)	:	(258)	IfEnd	(259)	:	(260)	Lbl
(261)	3	(262)	:	(263)	B	(264)	≥	(265)	D	(266)	↓	(267)	2	(268)	⇒	(269)	Goto	(270)	4
(271)	:	(272)	Goto	(273)	5	(274)	:	(275)	Lbl	(276)	4	(277)	:	(278)	If	(279)	A	(280)	≤
(281)	B	(282)	:	(283)	Then	(284)	0	(285)	▲	(286)	:	(287)	Goto	(288)	9	(289)	:	(290)	Else
(291)	1	(292)	▲	(293)	D	(294)	-	(295)	C	(296)	-	(297)	sin ⁻¹	(298)	B	(299)	sin(	(300)	C
(301)	)	(302)	↓	(303)	A	(304)	→	(305)	A	(306)	▲	(307)	Goto	(308)	0	(309)	:	(310)	Lbl
(311)	5	(312)	:	(313)	If	(314)	B	(315)	sin(	(316)	C	(317)	)	(318)	>	(319)	A	(320)	:
(321)	Then	(322)	0	(323)	▲	(324)	Goto	(325)	9	(326)	:	(327)	Else	(328)	Goto	(329)	6	(330)	:
(331)	IfEnd	(332)	:	(333)	Lbl	(334)	6	(335)	:	(336)	If	(337)	B	(338)	sin(	(339)	C	(340))
(341)	=	(342)	A	(343)	:	(344)	Then	(345)	1	(346)	▲	(347)	cos ⁻¹	(348)	A	(349)	↓	(350)	B
(351)	→	(352)	A	(353)	▲	(354)	Goto	(355)	1	(356)	:	(357)	Else	(358)	Goto	(359)	7	(360)	:
(361)	IfEnd	(362)	:	(363)	Lbl	(364)	7	(365)	:	(366)	A	(367)	→	(368)	Y	(369)	:	(370)	D
(371)	-	(372)	C	(373)	-	(374)	sin ⁻¹	(375)	B	(376)	sin(	(377)	C	(378)	)	(379)	↓	(380)	A
(381)	→	(382)	A	(383)	:	(384)	If	(385)	Y	(386)	≥	(387)	B	(388)	:	(389)	Then	(390)	1
(391)	▲	(392)	A	(393)	▲	(394)	Goto	(395)	1	(396)	:	(397)	Else	(398)	2	(399)	▲	(400)	A
(401)	▲	(402)	6	(403)	→	(404)	M	(405)	:	(406)	Goto	(407)	1	(408)	:	(409)	IfEnd	(410)	:
(411)	Lbl	(412)	9																

Press MODE 1 (COMP) to exit the programme mode.

Example 1 To solve ABC . Given $\angle A = 50^\circ$, $c = AB = 8$, $\angle B = 70^\circ$. ①A.S.A.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
50 EXE 8 EXE 70 EXE	D [?] 0.	$\angle A = 50^\circ$, $M = 8$, $\angle B = 70^\circ$
1 EXE	60. Disp	Enter into ①A.S.A., $\angle C = 60^\circ$
EXE	7.076415447 Disp	$X = a = 7.076415447$
EXE	8.680508601 Disp	$Y = b = 8.680508601$

Example 2 To solve ABC . Given $\angle A = \frac{\pi}{3}$, $\angle B = 0.75$ rad. $a = BC = 8$. ②A.A.S.

Key sequences	Display	Explanation
SHIFT MODE 2	R 0.	Enter into Radian mode
Prog P2	A [?] 0.	Enter into Programme P2
π J3 EXE 0.75 EXE 8 EXE	D [?] 0.	$\angle A = \frac{\pi}{3}$, $\angle B = 0.75$ rad., $X = a = 8$
2 EXE	1.344395102. Disp	Enter into ②A.A.S., $\angle C = 1.344395102$ rad.
EXE	6.296709145 Disp	$Y = b = 6.296709145$
EXE	9.001865524 Disp	$M = c = 9.001865524$

Press SHIFT MODE 1 to return to degree MODE.

Example 3 To solve ABC . Given $a = 3$, $b = 5$, $c = 7$. ③S.S.S.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
3 EXE 5 EXE 7 EXE	D [?] 0.	$A = 3$, $B = 5$, $C = 7$
3 EXE	21.7867893 Disp	Enter into ③S.S.S., $X = \angle A = 21.7867893^\circ$
EXE	38.2132107 Disp	$Y = \angle B = 38.2132107^\circ$
EXE	120. Disp	$M = \angle C = 120^\circ$

Example 4 To solve ABC . Given $a = 3$, $\angle C = 120^\circ$, $b = 5$. ④S.A.S.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
3 EXE 120 EXE 5 EXE	D [?] 0.	$A = b = 3$, $B = a = 3$, $M = \angle C = 120^\circ$
4 EXE	7. Disp	Enter into ④S.A.S., $M = c = 7$
EXE	21.7867893 Disp	$X = \angle A = 21.7867893^\circ$
EXE	38.2132107 Disp	$Y = \angle B = 38.2132107^\circ$

Example 5 To solve ABC . Given $b = 4$, $c = 2$, $\angle B = 30^\circ$. ⑤S.S.A.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
4 EXE 2 EXE 30 EXE	D [?] 0.	$Y = b = 4$, $M = c = 2$, $\angle B = 30^\circ$
5 EXE	1. Disp	Enter into ⑤S.S.A., One triangle can be formed
EXE	A 135.5224878 Disp	$\angle A = 135.5224878^\circ$
EXE	C 14.47751219 Disp	$\angle C = 14.47751219^\circ$
EXE	5.605034154 Disp	$X = a = 5.605034154$

Example 6 To solve ABC . Given $b = 1$, $c = 4$, $\angle B = 60^\circ$. ⑥S.S.A.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
1 EXE 4 EXE 60 EXE	D [?] 0.	$Y = b = 1$, $M = c = 4$, $\angle B = 60^\circ$
5 EXE	0. Disp	Enter into ⑥S.S.A., No triangle can be formed

Example 7 To solve ABC . Given $b = 3$, $c = 4$, $\angle B = 30^\circ$. ⑦S.S.A.

Key sequences	Display	Explanation
Prog P2	A [?] 0.	Enter into Programme P2
3 EXE 4 EXE 30 EXE	D [?] 0.	$Y = b = 3$, $M = c = 4$, $\angle B = 30^\circ$
5 EXE	2. Disp	Enter into ⑦S.S.A., Two triangles can be formed
EXE	A 108.1896851 Disp	$\angle A = 108.1896851^\circ$
EXE	C 41.8103149 Disp	$\angle C = 41.8103149^\circ$
EXE	5.700169593 Disp	$X = a = 5.700169593$
EXE	A 11.8103149 Disp	Second answer $\angle A = 11.8103149^\circ$
EXE	C 138.1896851 Disp	Second answer $\angle C = 138.1896851^\circ$
EXE	X 1.228033638 Disp	Second answer $X = a = 1.228033638$

- (4) Find the centre, radius of a circle $x^2 + y^2 + Dx + Ey + F = 0$;
and the length of tangent from (x_0, y_0) .

MODE MODE 6 3 2 AC 2 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	D	(12)	:	(13)	-	(14)	A	(15)	↓
(16)	2	(17)	→	(18)	C	(19)	▲	(20)	-
(21)	B	(22)	↓	(23)	2	(24)	▲	(25)	√(
(26)	Ans	(27)	x^2	(28)	+	(29)	C	(30)	x^2
(31)	-	(32)	D	(33)	)	(34)	→	(35)	M
(36)	▲	(37)	?	(38)	→	(39)	X	(40)	:
(41)	?	(42)	→	(43)	Y	(44)	:	(45)	√(
(46)	X	(47)	x^2	(48)	+	(49)	Y	(50)	x^2
(51)	+	(52)	A	(53)	X	(54)	+	(55)	B
(56)	Y	(57)	+	(58)	D	(59))		

Press MODE 1 (COMP) to exit the programme mode.

Example Find the centre, radius of $x^2 + y^2 + 10x - 8y + 5 = 0$; and the length of tangent from $(3, -2)$

Key sequences	Display	Explanation
Prog P2	$A^?$ 0.	Enter into Programme P2
10 EXE -8 EXE 5 EXE	-5. Disp	$D = 10, E = -8, F = 5$
EXE	4. Disp	Centre = $(-5, 4)$
EXE	6. Disp	Radius = 6
EXE	$X^?$ 0.	
3 EXE -2 EXE	8.	Length of tangent = 8

Example Find the centre, radius of $4x^2 + 4y^2 - 12x + 16y + 21 = 0$; and the length of tangent from $(2, -2)$. Convert the equation of circle into: $x^2 + y^2 - 3x + 4y + \frac{21}{4} = 0$ first.

Key sequences	Display	Explanation
Prog P2	$A^?$ 0.	Enter into Programme P2
-3 EXE 4 EXE $\frac{21}{4}$ EXE	$3 \downarrow 2$ Disp	$D = -3, E = 4, F = \frac{21}{4}$
EXE	-2. Disp	Centre = $\left(\frac{3}{2}, -2\right)$
EXE	1. Disp	Radius = 1
EXE	$X^?$ 0.	
2 EXE -2 EXE	Math ERROR	$(2, -2)$ lies inside the circle Length of tangent does not exist

(5) Polynomial division $(ax^4 + bx^3 + cx^2 + dx + e) \div (fx + g)$

MODE MODE 6 3 4 AC 4 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	?	(18)	→	(19)	M	(20)	:
(21)	?	(22)	→	(23)	X	(24)	:	(25)	?
(26)	→	(27)	Y	(28)	:	(29)	-	(30)	Y
(31)	┐	(32)	X	(33)	→	(34)	Y	(35)	:
(36)	A	(37)	┐	(38)	X	(39)	▲	(40)	Ans
(41)	Y	(42)	+	(43)	B	(44)	┐	(45)	X
(46)	▲	(47)	Ans	(48)	Y	(49)	+	(50)	C
(51)	┐	(52)	X	(53)	▲	(54)	Ans	(55)	Y
(56)	+	(57)	D	(58)	┐	(59)	X	(60)	▲
(61)	Ans	(62)	X	(63)	Y	(64)	+	(65)	M

Press MODE 1 (COMP) to exit the programme mode.

Remark: If the polynomial is of degree = 3, $a = 0$.

Example $(4x^4 + 8x^2 + 2x - 1) \div (2x - 1)$

Key sequences	Display	Explanation
Prog P4	A? 0.	Enter into Programme P4
4 EXE 0 EXE 8 EXE 2 EXE -1 EXE 2 EXE -1 EXE	2. Disp	A = 4, B = 0, C = 8, D = 2, M = -1, X = f = 2, Y = g = -1
EXE	1. Disp	
EXE	9┐2 Disp	
EXE	13┐4 Disp	Quotient = $2x^3 + 1x^2 + \frac{9}{2}x + \frac{13}{4}$
EXE	9┐4	Remainder = $\frac{9}{4}$

(6) Polynomial division $(ax^4 + bx^3 + cx^2 + dx + e) \div (x^2 + fx + g)$

MODE MODE 6 3 4 AC 4 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	?	(18)	→	(19)	M	(20)	:
(21)	?	(22)	→	(23)	X	(24)	:	(25)	?
(26)	→	(27)	Y	(28)	:	(29)	-	(30)	X
(31)	→	(32)	X	(33)	:	(34)	-	(35)	Y
(36)	→	(37)	Y	(38)	:	(39)	A	(40)	▲
(41)	B	(42)	+	(43)	A	(44)	X	(45)	→
(46)	B	(47)	▲	(48)	C	(49)	+	(50)	X
(51)	Ans	(52)	+	(53)	A	(54)	Y	(55)	→
(56)	C	(57)	▲	(58)	D	(59)	+	(60)	X
(61)	Ans	(62)	+	(63)	B	(64)	Y	(65)	▲
(66)	M	(67)	+	(68)	C	(69)	Y		

Press MODE 1 (COMP) to exit the programme mode. **Remark:** If the degree of dividend = 3, $a = 0$.

Example $(4x^4 + 8x^2 + 2x - 1) \div (x^2 + 3x - 2)$

Key sequences	Display	Explanation
Prog P4	A [?] 0.	Enter into Programme P4
4 EXE 0 EXE 8 EXE 2 EXE -1 EXE 3 EXE -2 EXE	4. Disp	A = 4, B = 0, C = 8, D = 2, M = -1, X = f = 3, Y = g = -2
EXE	-12. Disp	
EXE	52 Disp	Quotient = $4x^2 - 12x + 52$
EXE	-178 Disp	
EXE	103	Remainder = $-178x + 103$

If the divisor is $px^2 + fx + g$, where $p \neq 0$, change it into $x^2 + \frac{f}{p}x + \frac{g}{p}$ and divide the quotient by p .

Example $(4x^4 + 7x^3 - 16x^2 - 2x + 7) \div (2x^2 + x - 1)$. First change into $x^2 + \frac{1}{2}x - \frac{1}{2}$.

Key sequences	Display	Explanation
Prog P4	A [?] 0.	Enter into Programme P4
4 EXE 0 EXE 8 EXE 2 EXE -1 EXE 0.5 EXE -0.5 EXE	4. Disp	A = 4, B = 0, C = 8, D = 2, M = -1, X = f = 0.5, Y = g = -0.5
EXE	-2. Disp	
EXE	11 Disp	Quotient = $\frac{1}{2}(4x^2 - 2x + 11)$
EXE	-4.5 Disp	
EXE	4.5	Remainder = $-4.5x + 4.5$

(7) Newton's Method to find the approximate root $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$ Polynomials up to degree 4

MODE MODE 6 3 4 AC 4 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	?	(18)	→	(19)	M	(20)	:
(21)	?	(22)	→	(23)	X	(24)	:	(25)	Lbl
(26)	1	(27)	:	(28)	(	(29)	3	(30)	A
(31)	X	(32)	^(	(33)	4	(34)	)	(35)	+
(36)	2	(37)	B	(38)	X	(39)	x^3	(40)	+
(41)	C	(42)	X	(43)	x^2	(44)	–	(45)	M
(46)	)	(47)	↓	(48)	(	(49)	4	(50)	A
(51)	X	(52)	x^3	(53)	+	(54)	3	(55)	B
(56)	X	(57)	x^2	(58)	+	(59)	2	(60)	C
(61)	X	(62)	+	(63)	D	(64)	)	(65)	→
(66)	Y	(67)	▲	(68)	If	(69)	Abs(	(70)	Y
(71)	–	(72)	X	(73)	)	(74)	≥	(75)	1
(76)	EXP	(77)	-	(78)	1	(79)	0	(80)	:
(81)	Then	(82)	Y	(83)	→	(84)	X	(85)	:
(86)	Goto	(87)	1	(88)	:	(89)	IfEnd		

Press MODE 1 (COMP) to exit the programme mode.

Example To find the approximate root of $f(x) = x^4 + 6x^3 + 3x^2 - 26x - 24 = 0$, initial guess = 1.5

Key sequences	Display	Explanation
Prog P4	A [?] 0.	Enter into Programme P4
1 EXE 6 EXE 3 EXE -26 EXE -24 EXE	X [?] 0.	A = 1, B = 6, C = 3, D = -26, M = -24
1.5 EXE	2.336148649 _{Disp}	1st approximation = 2.336148649
EXE	2.059893868 _{Disp}	2nd approximation = 2.059893868
EXE	2.002375203 _{Disp}	3rd approximation = 2.002375203
EXE	2.00000394 _{Disp}	4th approximation = 2.00000394

(8) To evaluate a 3×3 determinant: $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix}$.

MODE MODE 6 3 4 AC 4 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	?	(18)	→	(19)	X	(20)	:
(21)	?	(22)	→	(23)	Y	(24)	:	(25)	?
(26)	→	(27)	M	(28)	:	(29)	B	(30)	Y
(31)	M	(32)	–	(33)	M	(34)	X	(35)	C
(36)	:	(37)	?	(38)	→	(39)	M	(40)	:
(41)	Ans	(42)	+	(43)	D	(44)	M	(45)	C
(46)	–	(47)	M	(48)	Y	(49)	A	(50)	:
(51)	?	(52)	→	(53)	M	(54)	:	(55)	Ans
(56)	+	(57)	A	(58)	X	(59)	M	(60)	–
(61)	M	(62)	D	(63)	B				

Press MODE 1 (COMP) to exit the programme mode.

Example To evaluate $\begin{vmatrix} 1 & 2 & 3 \\ 0 & 1 & 4 \\ 1 & 2 & 1 \end{vmatrix}$.

Key sequences	Display	Explanation
Prog P4	A? 0.	Enter into Programme P4
1 EXE 2 EXE 3 EXE 0 EXE 1 EXE 4 EXE 1 EXE 2 EXE 1 EXE	-2.	The value of determinant = -2

(9) To find the vector cross product $(a\vec{i} + b\vec{j} + c\vec{k}) \times (d\vec{i} + e\vec{j} + f\vec{k})$

MODE MODE 6 3 4 AC 4 1

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	?	(18)	→	(19)	X	(20)	:
(21)	?	(22)	→	(23)	Y	(24)	:	(25)	B
(26)	Y	(27)	–	(28)	C	(29)	X	(30)	▲
(31)	C	(32)	D	(33)	–	(34)	A	(35)	Y
(36)	▲	(37)	A	(38)	X	(39)	–	(40)	B
(41)	D								

Press MODE 1 (COMP) to exit the programme mode.

Example To find $(3\vec{i} - 4\vec{j}) \times \left(-\frac{3}{4}\vec{i} + 5\vec{j} + \vec{k}\right)$

Key sequences	Display	Explanation
Prog P4	A? 0.	Enter into Programme P4
3 EXE -4 EXE 0 EXE -0.75 EXE 5 EXE 1 EXE	-4. Disp	coefficient of $\vec{i} = -4$
EXE	-3. Disp	coefficient of $\vec{j} = -3$
EXE	12.	coefficient of $\vec{k} = 12$

answer is $-4\vec{i} - 3\vec{j} + 12\vec{k}$

(10) To solve $f(x) = ax^3 + bx^2 + cx + d = 0$, where $a \neq 0$ and a, b, c, d may be complex numbers.

Calculator Programme for Casio fx-50FH II MODE MODE 6 3 3 AC 3 (CMPLX) 2

(1)	?	(2)	→	(3)	A	(4)	:	(5)	?
(6)	→	(7)	B	(8)	:	(9)	?	(10)	→
(11)	C	(12)	:	(13)	?	(14)	→	(15)	D
(16)	:	(17)	B	(18)	x^3	(19)	–	(20)	9
(21)	↓	(22)	2	(23)	A	(24)	(	(25)	B
(26)	C	(27)	–	(28)	3	(29)	D	(30)	A
(31)	→	(32)	D	(33)	:	(34)	B	(35)	x^2
(36)	–	(37)	3	(38)	A	(39)	C	(40)	→
(41)	C	(42)	:	(43)	$\sqrt{}$(	(44)	D	(45)	x^2
(46)	–	(47)	C	(48)	x^3	(49)	:	(50)	Ans
(51)	–	(52)	D	(53)	–	(54)	2	(55)	Ans
(56)	(	(57)	Ans	(58)	=	(59)	D	(60)	→
(61)	D	(62)	:	(63)	$\sqrt[3]{}$(	(64)	Abs(	(65)	Ans
(66)	\Rightarrow	(67)	Ans	(68)	\angle	(69)	(	(70)	3
(71)	x^{-1}	(72)	arg(	(73)	D	(74)	→	(75)	D
(76)	:	(77)	While	(78)	1	(79)	:	(80)	Abs(
(81)	D	(82)	\Rightarrow	(83)	D	(84)	+	(85)	C
(86)	↓	(87)	D	(88)	:	(89)	(	(90)	Ans
(91)	–	(92)	B	(93)	)	(94)	↓	(95)	(
(96)	3	(97)	A	(98)	▲	(99)	D	(100)	×
(101)	1	(102)	\angle	(103)	5	(104)	!	(105)	°
(106)	→	(107)	D	(108)	:	(109)	WhileEnd		

Press MODE 1 (COMP) to exit the programme mode.

Remark: to press the degree symbol ° : Press Shift Ans 1 .

Programme demonstration To solve $x^3 - 6x - 9 = 0$

Key sequences	Display	Explanation
AC Prog P3	A [?] 0.	Enter into P3 CMPLX mode
1 EXE 0 EXE -6 EXE -9 EXE	3. Disp	A = 1, B = 0, C = -6, D = -9, 1st ans.= 3
EXE	-1.5 Disp R↔I	
SHIFT EXE	0.866025403 _i Disp R↔I	2nd answer = -1.5 + 0.866025403i
EXE	-1.5 Disp R↔I	
SHIFT EXE	-0.866025403 _i Disp R↔I	3rd answer M = -1.5 – 0.866025403i

Press AC and then MODE 1 to exit the programme mode and the CMPLX mode.

To solve $x^2 + 2x + 3 = 0$. Multiply the equation by X to give $x^3 + 2x^2 + 3x = 0$.

Remaining steps are the same, discard the first answer $X = 0$. Press MODE 1 to exit CMPLX mode.