1982 FG9.2

方程 $x^2 - 15x + B = 0$ 的根為 7 及 C。求 B 和 C 的值。

The roots of the equation $x^2 - 15x + B = 0$ are 7 and C. Find the values of B and C.

1983 FG6.3

兩數之和為 10，其乘積為 20。若該兩倒數之和為 c，求 c 的值。

The sum of two numbers is 10, their product is 20.

The sum of their reciprocal is c. What is the value of c?

1984 FI1.3

若 1 為 $x^2 + cx - 5 = 0$ 之一根，求 c 的值。

If 1 is a root of $x^2 + cx - 5 = 0$, find the value of c.

1984 FI2.1

若 α、β 為 $x^2 - 10x + 20 = 0$ 之根，且 $a = \dfrac{1}{\alpha} + \dfrac{1}{\beta}$，求 a 的值。

If α, β are roots of $x^2 - 10x + 20 = 0$, find the value of a, where $a = \dfrac{1}{\alpha} + \dfrac{1}{\beta}$.

1984 FSG.1

某兩數之和為 20，其積為 10，若該兩數倒數之和為 a，求 a 的值。

The sum of 2 numbers is 20, their product is 10.

If the sum of their reciprocals is a, find the value of a.

1985 FSI.1

某兩數之和為 40，其積為 20。若該兩數倒數之和為 a，求 a 的值。

The sum of two numbers is 40, and their product is 20.

If the sum of their reciprocals is a, find the value of a.

1985 FI1.3

若 2 為方程 $x^3 + cx + 10 = 0$ 之一根，求 c 的值。

If one root of the equation $x^3 + cx + 10 = 0$ is 2, find the value of c.

1986 FSG.1

某兩數之和為 50，其積為 25。若該兩數倒數之和為 a，求 a 的值。

The sum of two numbers is 50, and their product is 25.

If the sum of their reciprocals is a, find the value of a.

1987 FG6.1

若 α，β 為 $x^2 - 10x + 20 = 0$ 之根，且 $p = \alpha^2 + \beta^2$，求 p 的值。

If α, β are the roots of $x^2 - 10x + 20 = 0$, and $p = \alpha^2 + \beta^2$, find the value of p.

1988 FI1.4

若 $3x^2 - ax + 50 = 0$ 的其中一根是 $\dfrac{50}{9}$，而另一根是 S，求 S 的值。

If one root of the equation $3x^2 - ax + 50 = 0$ is $\dfrac{50}{9}$ and the other root is S,

find the value of S.

1989 HI16

已知 α、β 為 $x^2 - 10x + c = 0$ 的兩根，且 $\alpha\beta = -11$ 及 $\alpha > \beta$，求 $\alpha - \beta$ 的值。

α, β are the roots of the equation $x^2 - 10x + c = 0$.

If $\alpha\beta = -11$ and $\alpha > \beta$, find the value of $\alpha - \beta$.

1989 HG1

a、b 為兩相異實數，且 $a^2 = 5a + 10$ 及 $b^2 = 5b + 10$，求 $\dfrac{1}{a^2} + \dfrac{1}{b^2}$ 的值。

Given a and b are distinct real numbers satisfying $a^2 = 5a + 10$ and $b^2 = 5b + 10$.

Find the value of $\dfrac{1}{a^2} + \dfrac{1}{b^2}$.

1989 FI3.1

已知 $\alpha + \beta = 11$，$\alpha\beta = 24$，且 $\alpha > \beta$，求 α 的值。

If $\alpha + \beta = 11$, $\alpha\beta = 24$ and $\alpha > \beta$, find the value of α.

1990 HI8

若 α、β 是方程 $2x^2 + 4x - 3 = 0$ 的根，且 α^2、β^2 是方程 $x^2 + px + q = 0$ 的根，求 p 的值。

If α, β are the roots of the equation $2x^2 + 4x - 3 = 0$ and α^2, β^2 are the roots of the equation $x^2 + px + q = 0$, find the value of p.

1990 FI4.2

若 5 是方程 $x^2 - bx + 35 = 0$ 的一個根，求 b 的值。

If 5 is one root of the equation $x^2 - bx + 35 = 0$, find the value of b.

1991 HI12

設方程 $(x^2 - 11x - 10) + k(x + 2) = 0$ 的其中一根為零，求另一根。

If one root of the equation $(x^2 - 11x - 10) + k(x + 2) = 0$ is zero, find the other root.

1991 HI14

a、b 為兩個不同之實數，且 $a^2 = 6a + 8$ 及 $b^2 = 6b + 8$，求 $\left(\dfrac{4}{a}\right)^2 + \left(\dfrac{4}{b}\right)^2$ 的值。

a, b are two different real numbers such that $a^2 = 6a + 8$ and $b^2 = 6b + 8$.

Find the value of $\left(\dfrac{4}{a}\right)^2 + \left(\dfrac{4}{b}\right)^2$.

1991 FG6.3

兩數之和是 20，積是 5。若該兩數倒數之和是 z，求 z 的值。

The sum of two numbers is 20 and their product is 5.

If the sum of their reciprocals is z, find the value of　z.

1992 FI5.1

設 p、q 為二次方程 $x^2 - 3x - 2 = 0$ 的兩根，且 $a = p^3 + q^3$，求 a 的值。

Let p, q be the roots of the quadratic equation $x^2 - 3x - 2 = 0$ and $a = p^3 + q^3$.

Find the value of　a.

1992 FG8.3

方程 $x^3 - 173x^2 + 339x + 513 = 0$ 之根為 -1、171 及 c。求 c 的值。

The roots of the equation $x^3 - 173x^2 + 339x + 513 = 0$ are　-1, 171 and c.

Find the value of c.

1993 HG2

若 α、β 為方程 $x^2 - 3x - 3 = 0$ 的兩根，求 $\alpha^3 + 12\beta$ 的值。

If α, β are the roots of the equation $x^2 - 3x - 3 = 0$, find the value of $\alpha^3 + 12\beta$.

1997 FI5.4

若方程式 $x^2 - 6x + 5 = 0$ 兩根之差為 d，求 d 的值。

If the difference of the two roots of the equation　$x^2 - 6x + 5 = 0$ is d,

find the value of d.

1998 FI5.1

若方程 $5x^2 + ax - 2 = 0$ 的根的和為它的根的積的兩倍，求 a 的值。

If the sum of roots of　$5x^2 + ax - 2 = 0$　is twice the product of roots,

find the value of a.

1999 FG4.2

設 α、β 是 $x^2 + bx - 2 = 0$ 的根。若 $\alpha > 1$ 及 $\beta < -1$，且 b 為一整數，求 b 之值。

Let α, β be the roots of $x^2 + bx - 2 = 0$. If $\alpha > 1$ and $\beta < -1$, and b is an integer, find the value of　b.

1999 FG5.1

若 $x^2 - 2x - P = 0$ 的根相差 12，求 P 之值。

If the roots of $x^2 - 2x - P = 0$ differ by 12 , find the value of　P.

2001 FI1.4

已知 $\begin{cases} a + b = 2 \\ a^2 + b^2 = 12 \end{cases}$ 及 $a^3 + b^3 = S$，求 S 的值。

Given that $\begin{cases} a + b = 2 \\ a^2 + b^2 = 12 \end{cases}$ and $a^3 + b^3 = S$, find the value of　S.

2003 HG6

設拋物綫 $y = 4x^2 - 5x + c$ 與 x-軸相交於 $(\cos\theta, 0)$ 及 $(\cos\phi, 0)$。

若 θ 和 ϕ 分別為一直角三角形中兩銳角的角度，求 c 的值。

Suppose the parabola $y = 4x^2 - 5x + c$ intersects the x-axis at $(\cos\theta, 0)$ and $(\cos\phi, 0)$ respectively. If θ and ϕ are two acute angles of a right-angled triangle, find the value of c.

2004 HI10

若 α 和 β 是二次方程式 $4x^2 - 10x + 3 = 0$ 的根及 $k = \alpha^2 + \beta^2$，求 k 的值。

If　α　and　β　are the roots of the quadratic equation　$4x^2 - 10x + 3 = 0$ and $k = \alpha^2 + \beta^2$, find the value of　k.

2004 FI3.4

若 -2 和 9 是方程 $px^2 + dx = 1$ 的根，求 d 的值。

If -2 and 9 are the roots of the equation $px^2 + dx = 1$, find the value of d.

2005 HG3

已知 p、q 和 r 是方程 $x^3 - x^2 + x - 2 = 0$ 的三個不同的根。

若 $Q = p^3 + q^3 + r^3$，求 Q 的值。

Given that　p, q and　r are distinct roots of the equation　$x^3 - x^2 + x - 2 = 0$.

If　$Q = p^3 + q^3 + r^3$, find the value of Q.

2006 HG4

考慮二次方程 $x^2 - (a - 2)x - a - 1 = 0$，其中 a 為實數。設 α 和 β 是方程的根。求 a 的值使得 $\alpha^2 + \beta^2$ 的值最小。

Consider the quadratic equation $x^2 - (a - 2)x - a - 1 = 0$, where a is a real number. Let α and β be the roots of the equation.

Find the value of a such that the value of $\alpha^2 + \beta^2$ will be the least.

2006 FI1.4

已知 10 是方程 $kx^2 + 2x + 5 = 0$ 的一個根，其中 k 為常數。

若 D 是另一個根，求 D 的值。

Given that 10 is a root of the equation $kx^2 + 2x + 5 = 0$, where k is a constant.

If　D　is another root, find the value of D.

2006 FG1.3

已知 $x = 2 + \sqrt{3}$ 是方程 $x^2 - (\tan\alpha + \cot\alpha)x + 1 = 0$ 的一個根。

若 $C = \sin\alpha \times \cos\alpha$，求 C 的值。

Given that　$x = 2 + \sqrt{3}$　is a root of the equation $x^2 - (\tan\alpha + \cot\alpha)x + 1 = 0$.

If　$C = \sin\alpha \times \cos\alpha$, find the value of　C.

2007 HI4

設 r_1 和 r_2 是方程 $(x - 2006)(x - 2007) = 2007$ 的兩個實根。

若 r 是方程 $(x - r_1)(x - r_2) = -2007$ 較小的實根，求 r 的值。

Let r_1 and r_2 be the two real roots of the equation $(x - 2006)(x - 2007) = 2007$.

If r is the smaller real root of the equation $(x - r_1)(x - r_2) = -2007$,

find the value of r.

2007 HI5

已知 α 及 β 是方程 $x^2 - 5^{2007}x + 5^{1000} = 0$ 的根。

若 $s = \log_{25}\dfrac{\alpha^2}{\beta} + \log_{25}\dfrac{\beta^2}{\alpha}$ ，求 s 的值。

Given that α and β are the roots of the equation $x^2 - 5^{2007}x + 5^{1000} = 0$.

If $s = \log_{25}\dfrac{\alpha^2}{\beta} + \log_{25}\dfrac{\beta^2}{\alpha}$, find the value of s.

2008 FI3.1

已知 $\dfrac{1-\sqrt{3}}{2}$ 滿足方程 $x^2 + px + q = 0$，其中 p 和 q 是有理數。

若 $A = |p| + 2|q|$，求 A 的值。

Given that $\dfrac{1-\sqrt{3}}{2}$ satisfies the equation $x^2 + px + q = 0$, where p and q are

rational numbers. If $A = |p| + 2|q|$, find the value of A.

2008 FIS.3

設 α 和 β 是方程 $x^2 + cx + 2 = 0$ 的兩個根，其中 $c < 0$ 及 $\alpha - \beta = 1$。求 c 的值。

Let α and β be the two roots of the equation $x^2 + cx + 2 = 0$, where $c < 0$ and

$\alpha - \beta = 1$. Find the value of c.

2009 FI1.1

設 a、b、c 及 d 為方程 $x^4 - 15x^2 + 56 = 0$ 相異的根。

若 $R = a^2 + b^2 + c^2 + d^2$，求 R 的值。

Let a, b, c and d be the distinct roots of the equation $x^4 - 15x^2 + 56 = 0$.

If $R = a^2 + b^2 + c^2 + d^2$, find the value of R.

2010 HI2

若 α 及 β 為二次方程 $x^2 - x - 1 = 0$ 的兩個實根，求 $\alpha^6 + 8\beta$ 的值。

If α and β are the two real roots of the quadratic equation $x^2 - x - 1 = 0$,

find the value of $\alpha^6 + 8\beta$.

2011 FG3.2

設 a、b 及 c 為實數。若 1 為 $x^2 + ax + 2 = 0$的根及 a 和 b 為 $x^2 + 5x + c = 0$

的根，求 $a + b + c$ 的值。

Let a, b and c be real numbers. If 1 is a root of $x^2 + ax + 2 = 0$

and a and b be roots of $x^2 + 5x + c = 0$, find the value of $a + b + c$.

2012 FI1.1

若 A 是多項式 $x^4 + 6x^3 + 12x^2 + 9x + 2$ 的所有根的平方之和，求 A 的值。

If A is the sum of the squares of the roots of $x^4 + 6x^3 + 12x^2 + 9x + 2$,

find the value of A.

2013 HG4

若 α、β 是方程 $x^2 + 2013x + 5 = 0$ 的根，

求 $(\alpha^2 + 2011\alpha + 3)(\beta^2 + 2015\beta + 7)$ 的值。

If α, β are roots of $x^2 + 2013x + 5 = 0$,

find the value of $(\alpha^2 + 2011\alpha + 3)(\beta^2 + 2015\beta + 7)$.

2013 HG7

已知 ΔABC 的三邊的長度組成一個等差數列，

且為方程 $x^3 - 12x^2 + 47x - 60 = 0$ 的根，求 ΔABC 的面積。

Given that the length of the three sides of ΔABC form an arithmetic sequence, and

are the roots of the equation $x^3 - 12x^2 + 47x - 60 = 0$, find the area of ΔABC.

2013 FI4.3

若 1、2 及 3 為方程 $x^4 + rx^2 + sx + t = 0$ 的根，求 $c = r + t$ 的值。

If $1, 2$ and 3 are three roots of the equation $x^4 + rx^2 + sx + t = 0$,

find the value of $c = r + t$.

2014 HI4

設 α 及 β 為二次方程 $x^2 - 14x + 1 = 0$ 的根。求 $\dfrac{\alpha^2}{\beta^2+1} + \dfrac{\beta^2}{\alpha^2+1}$ 的值。

Let α and β be the roots of the quadratic equation $x^2 - 14x + 1 = 0$.

Find the value of $\dfrac{\alpha^2}{\beta^2+1} + \dfrac{\beta^2}{\alpha^2+1}$.

2015 FI2.4

若方程 $x^4 + ax^2 + bx + \delta = 0$ 有四實根，且已知其中三個為 1、2 及 4，

求 δ 的值。

If the equation $x^4 + ax^2 + bx + \delta = 0$ has four real roots with three of them being

1, 2 and 4, determine the value of δ.

2016 HI11

已知方程 $100[\log(63x)][\log(32x)] + 1 = 0$ 有兩個相異的實數根 α 及 β，

求 $\alpha\beta$ 的值。

It is known that the equation $100[\log(63x)][\log(32x)] + 1 = 0$ has two distinct real roots α and β. Find the value of $\alpha\beta$.

2016 FI1.3

若方程 $x^2 - cx + 30 = 0$ 有兩個實數根及兩根之差為 1，

求兩根之和的最大可能值 c。

If the equation $x^2 - cx + 30 = 0$ has two distinct real roots and their difference is 1, determine the greatest possible value of the sum of the roots, c .

2019 HI9

已知 α 及 β 為方程 $x^2 + 32x - 1 = 0$ 的兩個根。

若 $P = (\alpha^2 + 31\alpha - 2)(\beta^2 + 33\beta)$，求 P 的值。

Given that α and β are the two roots of the equation $x^2 + 32x - 1 = 0$.

If $P = (\alpha^2 + 31\alpha - 2)(\beta^2 + 33\beta)$, find the value of P .

2021 P1Q3

α 及 β 為方程 $x^2 - 7x + 4 = 0$ 的根。求 $\alpha^3 + \beta^3$ 的值。

α and β are the roots of the equation $x^2 - 7x + 4 = 0$. Find the value of $\alpha^3 + \beta^3$.

2022 P1Q1

α 及 β 是方程 $x^2 - 100x + k = 0$ 的實根。若 $\alpha - 7 = 30\beta$，求 k 的值。

α and β are the real roots of the equation $x^2 - 100x + k = 0$.
If $\alpha - 7 = 30\beta$, find the value of k .

2024 FG4.3

設 α、β 為二次方程 $x^2 + 6x + 2 = 0$ 的兩個根，

求以 $\dfrac{\alpha^2}{\beta}$ 和 $\dfrac{\beta^2}{\alpha}$ 為根及 x^2 的系數為 1 的二次方程。

Let α, β be the two roots of the quadratic equation $x^2 + 6x + 2 = 0$. Find the quadratic equation whose roots are $\dfrac{\alpha^2}{\beta}$ and $\dfrac{\beta^2}{\alpha}$, and coefficient of x^2 is 1 .

Answers

1982 FG9.2 $B = 56, C = 8$	1983 FG6.3 $\dfrac{1}{2}$	1984 FI1.3 4	1984 FI2.1 $\dfrac{1}{2}$	1984 FSG.1 2
1985 FSI.1 2	1985 FI1.3 −9	1986 FSG.1 2	1987 FG6.1 60	1988 FI1.4 3
1989 HI16 12	1989 HG1 $\dfrac{9}{20}$	1989FI3.1 8	1990 HI8 −7	1990 FI4.2 12
1991 HI12 6	1991 HI14 13	1991 FG6.3 4	1992 FI5.1 45	1992 FG8.3 3
1993 HG2 45	1997 FI5.4 4	1998 FI5.1 4	1999 FG4.2 0	1999 FG5.1 35
2001 FI1.4 32	2003 HG6 $\dfrac{9}{8}$	2004 HI10 $\dfrac{19}{4}$	2004 FI3.4 $-\dfrac{7}{18}$	2005 HG3 4
2006 HG4 1	2006 FI1.4 −2	2006 FG1.3 $\dfrac{1}{4}$	2007 HI4 2006	2007 HI5 500
2008 FI3.1 2	2008 FIS.3 −3	2009 FI1.1 30	2010 HI2 13	2011 FG3.2 1
2012 FI1.1 12	2013 HG4 8028	2013 HG7 6	2013 FI4.3 −61	2014 HI4 193
2015 FI2.4 −56	2016 HI11 $\dfrac{1}{2016}$	2016 FI1.3 11	2019 HI9 32	2021 P1Q3 259
2022 P1Q1 291	2024 FG4.3 $x^2 + 90x + 2 = 0$			