1985 FG10.1

三連續奇數(最小者為 k)之和為 51。求 k 的值。

The sum of 3 consecutive odd integers (the smallest being k) is 51.
Find the value of k .

1988 FI1.2

一狐狸在 5 天內吃提子 100 粒，而每天較前一天多吃 6 粒。假如牠在第一天吃了 Q 粒提子，求 Q 的值。

A fox ate 100 grapes in 5 days, each day eating 6 more than on the previous day. If he ate Q grapes on the first day, find the value of Q .

1990 HG5

歐拉在 1700 A.D.和 1800 A.D.之間出生和去世。在 n^3 A.D.時，他剛好 n + 9 歲，而他在 76 歲時去世。求歐拉去世的年份。

Euler was born and died between 1700 A.D. and 1800 A.D. He was n + 9 years old in n^3 A.D. and died at the age of 76. Find the year in which Euler died.

1992 HI7

已知 n 為一正整數，求 $x^{2^n}-10^{2^n}=0$ 的<u>所有</u>實根。

Given that n is a positive integer, find **ALL** the real roots of $x^{2^n}-10^{2^n}=0$.

1992 FSI.3

從下列方程求 C: $\sqrt{\dfrac{20\times 4+45}{C}}=C$ 。

Solve for C in the following equation: $\sqrt{\dfrac{20\times 4+45}{C}}=C$.

1993 FI1.3

若方程 $(x-2)(x-2)(x+1)=3(x-2)(x+1)$ 正根的總數為 c，求 c 的值。

If c is the total number of positive roots of the equation
$(x-2)(x-2)(x+1)=3(x-2)(x+1)$, find the value of c .

1994 FI1.2

在一次測驗中，共 20 題。做對一題給 6 分，做錯一題要倒扣 3 分。一學生做了全部的 20 題，而得到 48 分。他答對了的題目數目是 b。求 b 的值。

In a test, there are 20 questions. 6 marks will be given to a correct answer and 3 marks will be deducted for each wrong answer. A student has done all the 20 questions and scored 48 marks. Find b, the number of questions that he has answered correctly.

1994 FI3.4

已知對所有 x，$f(3+x)=f(3-x)$，且方程式 $f(x)=0$ 有 16 個不等根，求所有根的總和 d。

Given $f(3+x)=f(3-x)$ for all values of x, and the equation $f(x)=0$ has exactly 16 distinct roots. Find d, the sum of these roots.

1995 FI2.1

若 $\dfrac{x}{(x-1)(x-4)}=\dfrac{x}{(x-2)(x-3)}$，求 x 的值。

If $\dfrac{x}{(x-1)(x-4)}=\dfrac{x}{(x-2)(x-3)}$, find the value of x .

1996 HG6

若三位數 A 加上 3，新數的三個數字之和為原先 A 的三位數之和的三分之一。求所有這些可能的數目 A 的總和。

If 3 is added to a 3-digit number A, the sum of the digits of the new number is $\dfrac{1}{3}$ of the value of the sum of digits of the original number A. Find the sum of all such possible numbers A .

1996 FG6.1

一籃子雞蛋的數目為 a，分三輪派發。第一輪派出一半另半枚，第二輪派出剩下的一半另半枚，第三輪又派出剩下的一半另半枚。籃子中的雞蛋便全部派光，求 a 的值。

The number of eggs in a basket was a. Eggs were given out in three rounds. In the first round half of egg plus half an egg were given out. In the second round, half of the remaining eggs plus half an egg were given out. In the third round, again, half of the remaining eggs plus half an egg were given out. The basket then became empty. Find the value of a .

1997 HI7

求下列方程的實根： $x(x+1)(x^2+x+1)=x$。

Find the real roots of the equation: $x(x+1)(x^2+x+1)=x$.

1998 HI3

求下列方程式的最小實根：$\dfrac{x}{(x-4)(x+3)}=\dfrac{x}{(x+4)(x-6)}$ 。

Find the smallest real root of the following equation:
$\dfrac{x}{(x-4)(x+3)}=\dfrac{x}{(x+4)(x-6)}$.

1998 HG10

某測驗共有 25 題多項選擇題。每題答對得 4 分，答錯扣 1 分。某學生全答所有題目，得分 70，問該生共答對多少題？

A test is composed of 25 multiple-choice questions. 4 marks will be awarded for each correct answer and 1 mark will be deducted for each incorrect answer. A pupil answered all questions and got 70 marks.

How many questions did the pupil answer correctly?

1998 FI4.2

已知 $a \neq b$ 且 $ax = bx$。若 $15 + q = 19(a - b)^x$，求 q 的數值。

Given that $a \neq b$ and $ax = bx$. If $15 + q = 19(a - b)^x$, find the value of q .

1998 FI5.2

已知 $y = 4x^2 - bx - 13$ 穿過(3, 8)，求 b 的數值。

Given that $y = 4x^2 - bx - 13$ passes through (3, 8), find the value of b .

1999 HI7

一班青年參加旅行，他們同意所有消費平均攤分。整個活動，他們共用去 288 元。其中有一位成員無法支付其所應付出的部份。其他成員願意各多付 4 元，湊夠其數。問共有多少青年參加這次旅行。

A group of youngsters went for a picnic. They agreed to share all expenses. The total amount used was $288. One youngster had no money to pay his share, and each of the others had to pay $4 more to cover the expenses.

How many youngsters were there in the group?

1999 FI1.4

若兩數 11 和 $\frac{11}{S}$ 的積等於它們的和，求 S 之值。

If the product of the numbers 11 and $\frac{11}{S}$ is the same as their sum,

find the value of S .

2003 FI1.2

若方程 $(x^2 - x - 1)^{x+4} = 1$ 有 Q 個整數解，求 Q 的值。

If the equation $(x^2 - x - 1)^{x+4} = 1$ has Q integral solutions, find the value of Q .

2003 FG3.4

已知函數 $f(x) = \begin{cases} -2x+1, \text{when } x<1 \\ x^2-2x, \text{when } x \geq 1 \end{cases}$。若 d 是 $f(x) = 3$ 的最大整數解，求 d 的值。

Given that $f(x) = \begin{cases} -2x+1, \text{when } x<1 \\ x^2-2x, \text{when } x \geq 1 \end{cases}$. If d is the maximum integral solution of $f(x) = 3$, find the value of d .

2004 FI3.1

設 $x \neq \pm 1$ 及 $x \neq -3$。若 a 是方程 $\frac{1}{x-1} + \frac{1}{x+3} = \frac{2}{x^2-1}$ 的實根，求 a 的值。

Let $x \neq \pm 1$ and $x \neq -3$. If a is the real root of the equation $\frac{1}{x-1} + \frac{1}{x+3} = \frac{2}{x^2-1}$, find the value of a .

2005 FI2.1

陳先生有 8 個兒子和 a 個女兒，他的每個兒子都有 8 個兒子和 a 個女兒。他的每個女兒都有 a 個兒子和 8 個女兒。已知陳先生的男孫比女孫多 1 個及 a 是個質數，求 a 的值。

Mr. Chan has 8 sons and a daughters. Each of his sons has 8 sons and a daughters. Each of his daughters has a sons and 8 daughters. It is known that the number of his grand sons is one more than the number of his grand daughters and a is a prime number, find the value of a .

2006 HI3

已知 $\cfrac{1}{2+\cfrac{3}{1+\cfrac{1}{x}}} = \frac{5}{28}$，求 x 的值。Given that $\cfrac{1}{2+\cfrac{3}{1+\cfrac{1}{x}}} = \frac{5}{28}$, find the value of x.

2009 HIS

已知 a 為負實數。若 $\frac{1}{a+\frac{1}{a+2}} = 2$，求 a 的值。

Given that a is a negative real number. If $\frac{1}{a+\frac{1}{a+2}} = 2$, find the value of a .

2010 FG2.3

已知 x 為一正實數，且滿足 $x \cdot 3^x = 3^{18}$。若 k 是一正整數且 $k < x < k + 1$，求 k 的值。

Given that x is a positive real number and $x \cdot 3^x = 3^{18}$. If k is a positive integer and $k < x < k + 1$, find the value of k .

2010 FG3.4

已知函數 f 對所有實數 x 皆滿足 $f(2+x)=f(2-x)$，且 $f(x)=0$ 恰好有四個相異實根。求這四個相異實根之和。

Given that the function f satisfies $f(2+x)=f(2-x)$ for every real number x and that $f(x)=0$ has exactly four distinct real roots.

Find the sum of these four distinct real roots.

2012 HG2

已知 x 是一個實數，且 $\sqrt{x-2012}+\sqrt{(5-x)^2}=x$，求 x 的值。

Given that x is a real number and $\sqrt{x-2012}+\sqrt{(5-x)^2}=x$.

Find the value of x .

2013 FG3.3

若 $f(n)=a^n+b^n$，其中 n 是正整數且 $f(3)=[f(1)]^3+f(1)$，求 $a\cdot b$ 的值。

If $f(n)=a^n+b^n$, where n is a positive integer and $f(3)=[f(1)]^3+f(1)$,

find the value of $a\cdot b$.

2014 FG4.4

求方程 $x^4+(x-4)^4=32$ 所有實根的乘積。

Determine the product of all real roots of the equation $x^4+(x-4)^4=32$.

2017 FI1.1

若 a 為 $\frac{1}{(x+2)(x+3)}=\frac{1}{(x+1)(x+4)}$ 的實數解的數量，求 a 的值。

If a is the number of real roots of $\frac{1}{(x+2)(x+3)}=\frac{1}{(x+1)(x+4)}$,

determine the value of a .

2017 FG3.3

求方程 $x^4+(x-4)^4=544$ 的實根之和 T 的值。

Determine the value of T, the sum of real roots of $x^4+(x-4)^4=544$.

2018 FG4.2

求方程 $(12x-1)(6x-1)(4x-1)(3x-1)=5$ 的所有實根之乘積 B 的值。

Determine the value of B, the product of all real roots of

$(12x-1)(6x-1)(4x-1)(3x-1)=5$

Answers

1985 FG10.1 15	1988 FI1.2 8	1990 HG5 1783	1992 HI7 ± 10	1992 FSI.3 5
1993 FI1.3 2	1994 FI1.2 12	1994 FI3.4 48	1995 FI2.1 0	1996 HG6 432
1996 FG6.1 7	1997 HI7 0	1998 HI3 –12	1998 HG10 19	1998 FI4.2 4
1998 FI5.2 5	1999 HI7 9	1999 FI1.4 10	2003 FI1.2 4	2003 FG3.4 3
2004 FI3.1 –2	2005 FI2.1 7	2006 HI3 –6	2009 HIS $-\frac{3}{2}$	2010 FG2.3 15
2010 FG3.4 8	2012 HG2 2037	2013 FG3.3 $-\frac{1}{3}$	2014 FG4.4 4	2017 FI1.1 0
2017 FG3.3 4	2018 FG4.2 $-\frac{1}{24}$			