Remainder and Factor theorem (HKMO Classified Questions by topics)

1984 FI1.4

若x+4為 $2x^2+3x+4d$ 之因式,求d的值。

If x + 4 is a factor of $2x^2 + 3x + 4d$, find the value of d.

1984 FI3.1

若 $a \stackrel{.}{\sim} 2x^3 - 3x^2 + x - 1$ 被 x + 1 除所得之餘數,求 a 的值。

If a is the remainder when $2x^3 - 3x^2 + x - 1$ is divided by x + 1, find the value of a.

1985 FI4.4

If $3x^3 - 2x^2 + dx - 96$ is divisible by x - 1, find the value of d.

1986 FSG.4

If $x^3 - 2x^2 + 60x + q$ is divisible by x + 2, find the value of q.

1987 FG10.3

若 $Cx^3 - 3x^2 + x - 1$ 除以 x + 1 得之餘數為 -7。求 C 的值。

When $Cx^3 - 3x^2 + x - 1$ is divided by x + 1, the remainder is -7. Find the value of C.

1988 FG7.4

If x + k is a factor of $3x^2 + 14x + 8$, find the value of k. (k is an integer.)

1989 FI2.3

x+3 是 x^2+6x+c 的因式。求 c 的值。

x + 3 is a factor of $x^2 + 6x + c$. Find the value of c.

1989 FG8.3

 $3x^2 + 4x + a$ 被 x + 2 除所得的餘數是 5。求 a 的值。

When $3x^2 + 4x + a$ is divided by x + 2, the remainder is 5. Find the value of a.

1990 FI1.1

若 2t+1 是 $4t^2+12t+a$ 的因式,求 a 的值。

Find the value of a if 2t + 1 is a factor of $4t^2 + 12t + a$.

1991 FI2.2

If the remainder of $x^3 - 16x^2 - 9x + 124$ when divided by x - 2 is b, find the value of b.

1992 HI5

設 f(x) 為 $x^4 + 64$ 和 $x^3 + 6x^2 + 16x + 16$ 的最大公因式,求 f(2)的值。 Let f(x) be the highest common factor of $x^4 + 64$ and $x^3 + 6x^2 + 16x + 16$, find the value of f(2).

1993 FI5.2

設 $f(x) = x^3 - 20x^2 + x - 20$ 及 $g(x) = x^4 + 3x^2 + 2$ 。若 h(x)為 f(x)和 g(x)的最大公因子,求 b = h(1)的值。

Let $f(x) = x^3 - 20x^2 + x - 20$ and $g(x) = x^4 + 3x^2 + 2$. If h(x) is the highest common factor of f(x) and g(x), find the value of b = h(1).

1994 FI4.1

 $x^6 - 8x^3 + 6$ 除以(x-1)(x-2), 其餘數為 7x - a, 求 a 的值。

The remainder when $x^6 - 8x^3 + 6$ is divided by (x - 1)(x - 2) is 7x - a, find the value of a.

1995 HG1

求方程 $x^3 + (x+1)^3 + (x+2)^3 = (x+3)^3$ 的正整數解數目。

Find the number of positive integral solutions of the equation $x^3 + (x + 1)^3 + (x + 2)^3 = (x + 3)^3$

1996 FI3.1

若 a 為實數及 $2a^3 + a^2 - 275 = 0$, 求 a 的值。

If a is a real number and $2a^3 + a^2 - 275 = 0$, find the value of a.

1997 FI4.3

若 $cx^3-3x+x-1$ 除以 x+1,餘數為 -7,求 c 的值。

If $cx^3 - 3x + x - 1$ is divided by x + 1, the remainder is -7, find the value of c.

1998 HI1

已知 $x^3 - 5x^2 + 2x + 8$ 能被 (x - a) 和 (x - 2a) 整除,且 a 為整數。求 a 的值。

Given that $x^3 - 5x^2 + 2x + 8$ is divisible by (x - a) and (x - 2a), where a is an integer, find the value of a.

2001 HI7

如果 p 為方程式 $2x^3 + 7x^2 - 29x - 70 = 0$ 的正實數根,求 p 的值。

If p is the positive real root of $2x^3 + 7x^2 - 29x - 70 = 0$, find the value of p.

2001 FI1.2

已知 $f(x) = x^2 + ax + b$ 是 $x^3 + 4x^2 + 5x + 6$ 和 $2x^3 + 7x^2 + 9x + 10$ 的公因式。若 f(1) = Q,求 Q 的值。

Given that $f(x) = x^2 + ax + b$ is the common factor of $x^3 + 4x^2 + 5x + 6$ and $2x^3 + 7x^2 + 9x + 10$. If f(1) = Q, find the value of Q.

2002 HI8

 $\ddot{x}^3 + kx^2 + 3$ 除以 x+3,其餘數較被 x+1 除所得的餘數少 $2 \circ \bar{x} k$ 的值。 When the expression $x^3 + kx^2 + 3$ is divided by x+3, the remainder is 2 less than

when divided by (x + 1). Find the value of k.

2004 FI4.2

已知 n 是自然數。若 $b=n^3-8n^2-12n+144$ 是質數,求 b 的數值。

Given that n is a natural number.

If $b = n^3 - 8n^2 - 12n + 144$ is a prime number, find the value of b.

2006 FG1.1

已知 k 為實數。若 $x^2 + 2kx - 3k^2$ 能被 x - 1 整除,求 k 最大可能的值。

Given that *k* is a real number.

If $x^2 + 2kx - 3k^2$ can be divisible by x - 1, find the greatest value of k.

2007 FI1.3

If x - 1 is a factor of $x^3 - 6x^2 + 11x + c$, find the value of c.

2011 FI3.2

已知 $x^2 + ax + b$ 為 $2x^3 + 5x^2 + 24x + 11$ 及 $x^3 + 7x - 22$ 的公因式。

若 Q = a + b, 求 Q 的值。

Given that $x^2 + ax + b$ is a common factor of $2x^3 + 5x^2 + 24x + 11$ and $x^3 + 7x - 22$.

If Q = a + b, find the value of Q.

2011 FI3.3

若 R 為一正整數及 $R^3 + 4R^2 - 80R + 192$ 為一質數, 求 R 的值。

If R is a positive integer and $R^3 + 4R^2 - 80R + 192$ is a prime number, find the value of R.

2018 HI6

若 x 為有理數, 求 x 的值滿足聯立方程 $\begin{cases} y = 2x^2 - 11x + 15 \\ y = 2x^3 - 17x^2 + 16x + 35 \end{cases}$ 。

If x is a rational number, find the value of x satisfying the simultaneous

equations
$$\begin{cases} y = 2x^2 - 11x + 15 \\ y = 2x^3 - 17x^2 + 16x + 35 \end{cases}$$
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2023 FI2.3

若 $m \cdot n$ 為整數,方程 $x^3 + nx^2 + mx + 5 = 0$ 有三個整數根。假設這三個根不全是正整數,若 $\gamma = n - m$,求 γ 的值。

The equation $x^3 + nx^2 + mx + 5 = 0$, where m, n are integers, has three integral roots. Suppose that the roots are not all positive, if $\gamma = n - m$, find the value of γ .

Answers

1004 ET1 4	1004 FI2 1	1007 FIA 4	1006 EGG 4	1007 EG10 2
1984 FI1.4	1984 FI3.1	1985 FI4.4	1986 FSG.4	1987 FG10.3
-5	-7	95	136	2
1988 FG7.4	1989 FI2.3	1989 FG8.3	1990 FI1.1	1991 FI2.2
4	9	1	5	50
1992 HI5	1993 FI5.2	1994 FI4.1	1995 HG1	1996 FI3.1
20	2	8	1	5
1997 FI4.3	1998 HI1	2001 HI7	2001 FI1.2	2002 HI8
8	2	3.5	4	3
2004 FI4.2	2006 FG1,1	2007 FI1.3	2011 FI3.2	2011 FI3.3
11	1	-6	13	5
2018 HI6	2023 FI2.3			
2.5	<u>-4</u>			