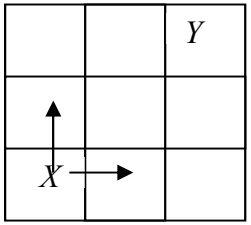
1982 FI2.2

在 17 人之中揀選 15 人，共有 b 種方法，求 b 的值。

If there are b ways of choosing 15 people from 17 people, find the value of b.

1983 FI4.1

右方棋盤為一 3×3 九宮格。一隻棋子放置在 X 的位置上，每次只可向上行一格，或向右行一格。問：由 X 行到 Y，共有多少種不同的路徑？



The figure shows a board consisting of nine squares. A counter originally on square X can be moved either upwards or to the right one square at a time. By how many different routes may the counter be moved from X to Y?

1984 FG10.3

一凸 n 邊形有 14 條對角線，求 n 的值。

An n-sided convex polygon has 14 diagonals. Find the value of n.

1985 FG8.3

一凸 20 邊形有 x 條對角線。求 x 的值。

A convex 20-sided polygon has x diagonals. Find the value of x.

1988 FG6.2

一凸 n 邊形有 35 條對角綫。求 n 的值。

A convex n-sided polygon has 35 diagonals. Find the value of n.

1989 FG6.1

一凸 n 邊形有 20 條對角線。求 n 的值。

An n-sided convex polygon has 20 diagonals. Find the value of n.

1991 FI2.3

若一凸 n 邊形有 54 條對角綫，求 n 的值。

If an n-sided polygon has 54 diagonals, find the value of n.

1993 HG9

一正方形的每邊被均分為四份，且以直綫連接如圖。

求非正方形的長方形數目。

Each side of a square is divided into four equal parts and straight lines are joined as shown in the figure. Find the number of rectangles which are not squares.

1994 FG6.4

從六名男士及四名女士中選出五人，組成一組。若其間共有 d 種選法，使男士必多於女士，求 d 的值。

A group of 5 people is to be selected from 6 men and 4 women. Find d, the number of ways that there are always more men than women.

1997 FG2.4

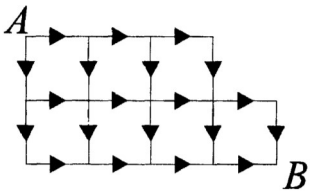
若將 5 個女孩排成一列，共有 d 個不同方法。求 d 的值。

There are d different ways for arranging 5 girls in a row. Find the value of d.

1998 HG6

在圖，沿箭頭方向前進，

求 A 到 B 點的不同路綫數目。



In the figure, find the number of possible paths from point A to point B following the direction of arrow heads.

1998 FI5.3

若有 c 種排法把 b 位女孩排成一圓，求 c 的值。

If there are c ways of arranging 5 girls in a circle, find the value of c.

1999 HI3

已知 8 點，其中沒有任何 3 點是共綫的。求以任意 3 點作為三角形頂點的三角形的個數。

8 points are given and no three of them are collinear. Find the number of triangles formed by using any 3 of the given points as vertices.

2000 HI4

在圖一，有一個 4×3 的矩形蜘蛛網。若有一隻蜘蛛沿著網絲爬行。而其爬行方向祇可向東或向北。該蜘蛛由 A 點到 C 點共有多少種可能路徑？

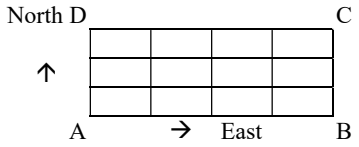


Figure 1 represents a 4×3 rectangular spiderweb.

If a spider walks along the web from A to C and it always walks either due East or due North. Find the total number of possible paths.

2000 HI6

於一白紙上，畫有 20 條直綫。該 20 條直綫，並沒有兩條或兩條以上是平行的，也沒有三條或三條以上的直綫共點，問這 20 條直綫最多可構成多少個交點？

Twenty straight lines were drawn on a white paper. Among them, no two or more straight lines are parallel; also no three or more than three straight lines are concurrent.

What is the maximum number of intersections that these 20 lines can form?

2000 HG5

有 5 個分別標上 A、B、C、D、E 的球及 5 個分別標上 A、B、C、D、E 的袋，每個袋放一個球。求恰好有 3 個球的標號與袋的標號相同的投放方法總數。

There are 5 balls with labels *A*, *B*, *C*, *D*, *E* respectively and there are 5 pockets with labels *A*, *B*, *C*, *D*, *E* respectively. A ball is put into each pocket.
Find the number of ways in which exactly 3 balls have labels that match the labels on the pockets.

2000 FG3.4

在坐標平面的原點上有一點 *P*。假如擲出骰子的點數 *n* 是偶數，*P* 在 *x* 方向右前進 *n*；如果 *n* 是奇數，*P* 在 *y* 方向上前進 *n*。如果有 *d* 種不同擲法使得 *P* 到達點(4, 4)，求 *d* 的值。

P is a point located at the origin of the coordinate plane. When a dice is thrown and the number *n* shown is even, *P* moves to the right by *n*. If *n* is odd, *P* moves upward by *n*. Find the value of *d* , the total number of tossing sequences for *P* to move to the point (4, 4) .

2000 FG4.4

A、*B*、*C*、*D*、*E*、*F*、*G* 七個人圍圓桌而坐。如果 *B* 及 *G* 都與 *C* 相鄰而坐的坐法總數為 *d*，求 *d* 的值。

A, *B*, *C*, *D*, *E*, *F*, *G* are seven people sitting around a circular table. If *d* is the total number of ways that *B* and *G* must sit next to *C* , find the value of *d* .

2001 HG2

把 10 個完全相同的球放入 3 個不同的盒子裏，使得沒有一個盒子是空的，共有多少種放法？

In how many ways can 10 identical balls be distributed into 3 different boxes such that no box is to be empty?

2001 FI4.2

若一正 *Q* 邊形有 35 條對角綫，求 *Q* 的值。

If a regular *Q*-sided polygon has 35 diagonals, find the value of *Q* .

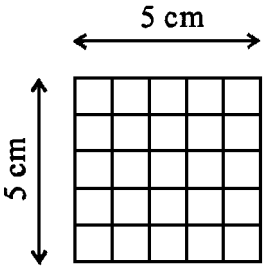
2003 HI5

課室內有 *n* 個人，若每個人恰好跟其他人各握手一次，則共有 28 次握手，求 *n* 的值。

There are *n* persons in the classroom. If each person in the classroom shakes hands exactly once with each other person in the classroom and there are altogether 28 handshakes. Find the value of *n* .

2003 HI8

圖中，一個面積為 25 cm^2 的正方形被分成 25 個邊長為 1 cm 的小正方形。若圖中共有 *K* 個不同的正方形，求 *K* 的值。



In the figure, a square with area equal to 25 cm^2 is divided into 25 small squares with side length equal to 1 cm. If the total number of different squares in the figure is *K*, find the value of *K* .

2005 FI1.4

一個正 8 邊形共有 *d* 條對角綫，求 *d* 的值。

A regular 8-sided polygon has *d* diagonals, find the value of *d* .

2006 HI6

已知 *w*、*x*、*y* 和 *z* 是正整數且滿足方程 $w+x+y+z=12$。若方程有 *W* 組不同的正整數解，求 *W* 的值。

Given that *w*, *x*, *y* and *z* are positive integers which satisfy the equation $w+x+y+z=12$. If there are *W* sets of different positive integral solutions of the equation, find the value of *W* .

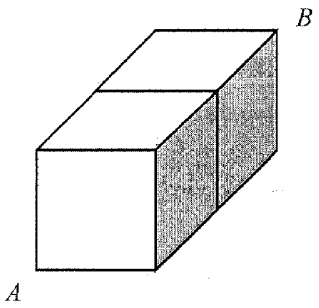
2007 HI3

在 4 本英文書、6 本中文書及 9 本日文書中任取兩本。已知這兩本書是相同語言的。若有 *X* 個不同的選擇，求 *X* 的值。

Among 4 English books, 6 Chinese books and 9 Japanese books, two books are selected. It is found that they are of the same language. If there are *X* such choices, find the value of *X* .

2007 HG5

如圖二，兩個邊長為 1 cm 的正方體組成一個 1 cm ×1 cm × 2 cm 的長方體。一隻螞蟻沿著長方體爬行，其爬行路綫須為正方體的棱。牠從頂點 *A* 出發，以每分鐘爬行 1 cm 的速度，於 4 分鐘後到達頂點 *B*。若螞蟻可行路綫數目共有 *S* 個，求 *S* 的值。



In Figure 2, a 1 cm × 1cm × 2 cm rectangular box is made by two cubes with side length 1 cm. An ant is climbing along the box in a way that it must stay on the edges of the cubes through out the climbing. Starting from vertex *A* and climbing with a speed of 1 cm per minutes, it reaches vertex *B* after 4 minutes. If the total number of possible paths taken by the ant is *S*, find the value of *S*.

2008 FG3.4

當從標明了 1 至 30 的 30 個號碼球中選出 4 個，而選出的球均不放回重選時，能得 r 個組合，求 r 的值。

When choosing, without replacement, 4 out of 30 labelled balls that are marked from 1 to 30, there are r combinations. Find the value of r .

2010 HI1

把 8 個完全相同的球放入三個不同的盒中，使得每個盒內至少有球一個，問共有多少個不同的分配方法？

In how many possible ways can 8 identical balls be distributed to 3 distinct boxes so that every box contains at least one ball ?

2010 FI2.3

在一個 5×5 的棋盤上任意選取兩個不在同一橫行上方格。

若 c 為選取的兩個不同方格的組合數目，求 c 的值。

In a 5×5 checkerboard, two squares not lying in the same row are randomly chosen. If c is the number of combinations of different pairs of squares chosen, find the value of c .

2011 FI1.4

若 S 為安排 8 個人圍成圓形的數目，求 S 的值。

If S is the number of ways to arrange 8 persons in a circle, find the value of S .

2012 HI2

已知 a、b 及 c 為正偶數，且滿足方程 $a+b+c=2012$。問該方程共有多少個解？

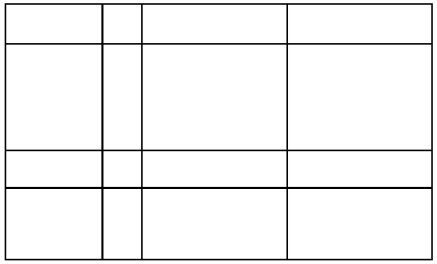
Given that a, b and c are positive even integers which satisfy the equation $a+b+c=2012$. How many solutions does the equation have?

2013 FI1.1

圖中共有 a 個長方形，求 a 的值。

The figure has a rectangles,

find the value of a .



2013 FG1.3

從 1、2、4、6、7 中選三個數字組成三位數。這些三位數有多少個能被 3 整除？

Choose three digits from 1, 2, 4, 6, 7 to construct three-digit numbers. Of these three-digit numbers, how many of them are divisible by 3?

2013 FG2.2

三男 B_1、B_2、B_3 和三女 G_1、G_2、G_3 就坐一排座位，並滿足以下兩個條件：

1) 一男不會坐在另一男旁邊及一女不會坐在另一女旁邊
2) B_1 必須坐在 G_1 旁邊

若 s 是這樣就坐的排列數量，求 s 的值。

Three boys B_1, B_2, B_3 and three girls G_1, G_2, G_3 are to be seated in a row according to the following rules:

1) A boy will not sit next to another boy and a girl will not sit next to another girl,
2) Boy B_1 must sit next to girl G_1

If s is the number of different such seating arrangements, find the value of s .

2015 HI1

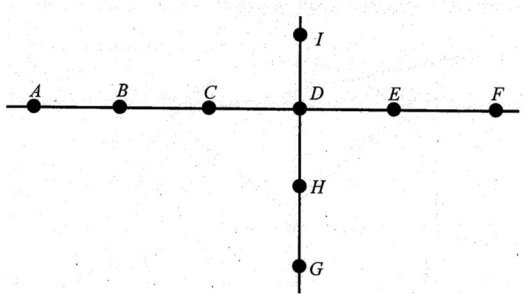
在 1 至 2015 之間(包括 1 及 2015 在內)有多少對相異整數的積是 5 的倍數?

How many pairs of distinct integers between 1 and 2015 inclusively have their products as multiple of 5 ?

2017 HG2

如圖一所示，點 A、B、C、D、E 及 F 均在一直綫上。點 G、H、D 及 I 在另一直綫上。揀選三點，可形成多少個三角形？

As shown in Figure 1, points A, B, C, D, E and F lie on the same straight line, and G, H, D and I lie on another straight line. How many triangles can be made by connecting any three points?



圖一 Figure 1

2017 FG2.2

立方體的任意兩個頂點可相連成一線段。若 B 為最多所能夠相連成的直線的數量，求 B 的值。

Any two vertices in a cube can form a line segment. If B is the greatest number of line segments thus formed, determine the value of B .

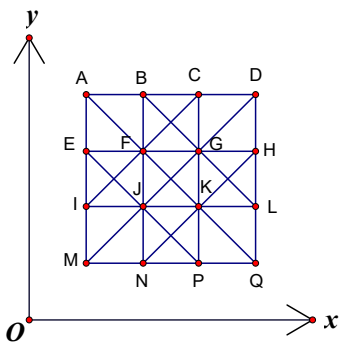
2018 HG8

已知 a、b、c、d、e、f、g 及 h 為正整數，使得 $a>b>c>d>e>f>g>h$ 及 $a+h=b+g=c+f=d+e=35$，問有多少組可行答案 $\{a, b, c, d, e, f, g, h\}$ 存在？

Given that a, b, c, d, e, f, g and h are positive integers such that $a>b>c>d>e>f>g>h$ and $a+h=b+g=c+f=d+e=35$. How many possible solution sets of $\{a, b, c, d, e, f, g, h\}$ exist?

2019 HI6

在圖三中，直角座標平面上一個正方形的四個頂點的座標分別為 (1, 1)、(1, 4)、(4, 1)及(4, 4)。若在該正方形中(包括邊界)選擇任何三個座標均為整數的點，問可組成多少個三角形？



In Figure 3, the vertices of a square in the rectangular coordinate plane are (1, 1), (1, 4), (4, 1) and (4, 4). How many triangles can be formed by selecting any three points in the square (including the boundaries) with integer coordinates?

2023 HG4

排列 5 個不同的單數及 5 個不同的雙數在同一行使得任意兩個相鄰數的積必為雙數。求所有排列的可能性數目。

Five distinct odd numbers and five distinct even numbers are arranged in a row such that the product of any two consecutive numbers is always even.
Find the number of all possible arrangements.

Answers

1982 FI2.2 136	1983 FI4.1 6	1984 FG10.3 7	1985 FG8.3 170	1988 FG6.2 10
1989 FG6.1 8	1991 FI2.3 12	1993 FG9 70	1994 FG6.4 186	1997 FG2.4 120
1998 HG6 14	1998 FI5.3 24	1999 HI3 56	2000 HI4 35	2000 HI6 190
2000 HG5 10	2000 FG3.4 38	2000 FG4.4 48	2001 HG2 36	2001 FI4.2 10
2003 HI5 8	2003 HI8 55	2005 FI1.4 20	2006 HI5 165	2007 HI3 57
2007 HG5 12	2008 FG3.4 27405	2010 HI1 21	2010 FI2.3 200	2011 FI1.4 5040
2012 HI2 504510	2013 FI1.1 100	2013 FG1.3 24	2013 FG2.2 40	2015 HI1 730639
2017 HG2 60	2017 FG2.2 28	2018 HG8 2380	2019 HI6 516	2023 HG4 86400