1990 HG1

若 $\frac{1}{a}+\frac{1}{b}=5$ 及 $\frac{1}{a^2}+\frac{1}{b^2}=13$，求 $\frac{1}{a^5}+\frac{1}{b^5}$ 的值。

If $\frac{1}{a}+\frac{1}{b}=5$ and $\frac{1}{a^2}+\frac{1}{b^2}=13$, find the value of $\frac{1}{a^5}+\frac{1}{b^5}$.

1992 HG1

有甲、乙、丙三人，甲的年齡較乙和丙的年齡之和大了 16 歲，甲年齡的平方較乙和丙的年齡之和的平方大 1632，求甲、乙、丙的年齡之和。

A, B, C are three men in a team. The age of A is greater than the sum of the ages of B and C by 16. The square of the age of A is greater than the square of the sum of the ages of B and C by 1632. Find the sum of the ages of A, B and C.

1993 HG8

若 x 及 y 為實數，且 $\begin{cases} x^2-xy+y^2-3x-3y=1 \\ xy=1 \end{cases}$ 及 $x>y>0$，求 x 的值。

If x and y are real numbers satisfying $\begin{cases} x^2-xy+y^2-3x-3y=1 \\ xy=1 \end{cases}$ and $x>y>0$, find the value of x.

1997 HI2

若一長方形之闊度增加 $\frac{1}{3}$ 米，其面積增加 $\frac{5}{3}$ 平方米。若其長度減少 $\frac{1}{2}$ 米，則面積減少 $\frac{9}{5}$ 平方米。設該長方形之面積為 x 平方米，求 x 之值。

If the width of a rectangle is increased by $\frac{1}{3}$ m, its area will be increased by $\frac{5}{3}$ m^2. If its length is decreased by $\frac{1}{2}$ m, its area will be decreased by $\frac{9}{5}$ m^2. Let the area of the rectangle be x m^2, find the value of x.

2003 FI3.1

已知 $\begin{cases} wxyz=4 \\ w-xyz=3 \end{cases}$ 且 $w>0$。若 w 的解是 P，求 P 的值。

Given that $\begin{cases} wxyz=4 \\ w-xyz=3 \end{cases}$ and $w>0$.

If the solution of w is P, find the value of P.

2008 HG7

設 x 及 y 為實數，且滿足 $\begin{cases} \left(x-\frac{1}{3}\right)^3+2008\left(x-\frac{1}{3}\right)=-5 \\ \left(y-\frac{7}{4}\right)^3+2008\left(y-\frac{7}{4}\right)=5 \end{cases}$ 。

若 $z=x+y$，求 z 的值。

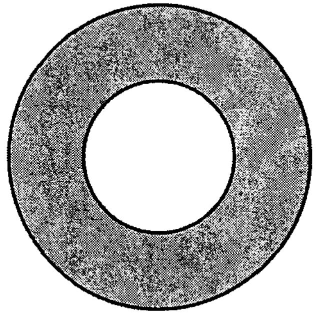
Let x and y be real numbers satisfying $\begin{cases} \left(x-\frac{1}{3}\right)^3+2008\left(x-\frac{1}{3}\right)=-5 \\ \left(y-\frac{7}{4}\right)^3+2008\left(y-\frac{7}{4}\right)=5 \end{cases}$.

If $z=x+y$, find the value of z.

2008 FI4.2

如圖一，陰影部分由兩同心圓所組成，其面積為 96π cm^2。若該兩圓的半徑相差 8 cm及大圓的面積為 Q cm^2，求 Q 的值。(取 $\pi=3$)

In Figure 1, the shaded area is formed by two concentric circles and has area 96π cm^2. If the two radii differ by 8 cm and the large circle has area Q cm^2, find the value of Q. (Take $\pi=3$)



2008 FG2.4

設實數 x、y 及 z 滿足 $x+\frac{1}{y}=4$，$y+\frac{1}{z}=1$ 及 $z+\frac{1}{x}=\frac{7}{3}$。求 xyz 的值。

Let x, y and z be real numbers that satisfy $x+\frac{1}{y}=4$, $y+\frac{1}{z}=1$ and $z+\frac{1}{x}=\frac{7}{3}$.

Find the value of xyz.

2010 FI1.3

已知 p 及 q 是實數，且 $pq=9$ 及 $p^2q+q^2p+p+q=70$。

若 $c=p^2+q^2$，求 c 的值。

Given that p and q are real numbers with $pq=9$ and $p^2q+q^2p+p+q=70$.

If $c=p^2+q^2$, find the value of c.

2010 FG2.2

已知 x、y、z 為 3 個相異實數。

若 $x+\frac{1}{y}=y+\frac{1}{z}=z+\frac{1}{x}$ 及 $m=x^2y^2z^2$。求 m 的值。

Given that x, y, z are three distinct real numbers.

If $x+\frac{1}{y}=y+\frac{1}{z}=z+\frac{1}{x}$ and $m=x^2y^2z^2$, find the value of m.

2011 FG3.3

設 x 及 y 為正實數且 $x<y$。若 $\sqrt{x}+\sqrt{y}=1$、$\sqrt{\frac{x}{y}}+\sqrt{\frac{y}{x}}=\frac{10}{3}$ 及 $x<y$，

求 $y-x$ 的值。

Let x and y be positive real numbers with $x<y$.

If $\sqrt{x}+\sqrt{y}=1$, $\sqrt{\frac{x}{y}}+\sqrt{\frac{y}{x}}=\frac{10}{3}$ and $x<y$, find the value of $y-x$.

2013 FI4.4

設(x_0, y_0) 是以下方程組的一個解：$\begin{cases} xy=6 \\ x^2y+xy^2+x+y-61=2 \end{cases}$

求 $d=x_0^2+y_0^2$ 的值。

Suppose that (x_0, y_0) is a solution of the system: $\begin{cases} xy=6 \\ x^2y+xy^2+x+y-61=2 \end{cases}$.

Find the value of $d=x_0^2+y_0^2$.

2015 HG8

已知 a、b、x 及 y 為非零整數，其中 $ax+by=4$、$ax^2+by^2=22$、$ax^3+by^3=46$ 及 $ax^4+by^4=178$。求 ax^5+by^5 的值。

Given that a, b, x and y are non-zero integers, where $ax+by=4$, $ax^2+by^2=22$, $ax^3+by^3=46$ and $ax^4+by^4=178$. Find the value of ax^5+by^5.

2017 FG1.1

若實數 x、y 及 z 滿足 $x+\frac{1}{y}=-1$，$y+\frac{1}{z}=-2$ 及 $z+\frac{1}{x}=-5$。求 $a=\frac{1}{xyz}$ 的值。

If real numbers x, y and z satisfy $x+\frac{1}{y}=-1$, $y+\frac{1}{z}=-2$ and $z+\frac{1}{x}=-5$. Determine the value of $a=\frac{1}{xyz}$.

2018 HG5

求可滿足下列方程組的 x 的值：$\begin{cases} x^2+9x-10y-220=0 & \cdots(1) \\ y^2-5x+6y-166=0 & \cdots(2) \\ xy=195 & \cdots(3) \end{cases}$.

Find the value of x that satisfy the following system of equations:

$$\begin{cases} x^2+9x-10y-220=0 \\ y^2-5x+6y-166=0 \\ xy=195 \end{cases}.$$

2019 HI15

已知 x、y 及 z 為正實數且滿足 $\begin{cases} x^2+xy+y^2=7 \\ y^2+yz+z^2=21 \\ x^2+xz+z^2=28 \end{cases}$。若 $a=x+y+z$，求 a 的值。

Given that x, y and z are positive real numbers satisfying $\begin{cases} x^2+xy+y^2=7 \\ y^2+yz+z^2=21 \\ x^2+xz+z^2=28 \end{cases}$.

If $a=x+y+z$, find the value of a.

2019 FG2.2

假設 $\begin{cases} x+y=5 \\ 4x^2+y^2=80 \end{cases}$，及 $P=(x_1,y_1)$ 和 $Q=(x_2,y_2)$ 為兩個不同的點，同時滿足這兩個等式。若 $B=y_1-x_1+y_2-x_2$，求 B 的值。

Suppose that $\begin{cases} x+y=5 \\ 4x^2+y^2=80 \end{cases}$, and $P=(x_1,y_1)$ and $Q=(x_2,y_2)$ are two different points, simultaneously satisfy these two equations.

If $B=y_1-x_1+y_2-x_2$, determine the value of B.

2023 HG6

設 x、y 及 z 為實數，且滿足方程 $\begin{cases} x+yz=6 \\ y+zx=6 \\ z+xy=6 \end{cases}$，求 xyz 的最大值。

If x, y and z are real numbers that satisfy the system of equations $\begin{cases} x+yz=6 \\ y+zx=6 \\ z+xy=6 \end{cases}$,

find the largest possible value of xyz .

Answers

1990 HG1 275	1992 HG1 102	1993 HG8 $2+\sqrt{3}$	1997 HI2 18	2003 FI3.1 4
2008 HG7 $\frac{25}{12}$	2008 FI4.2 300	2008 FG2.4 1	2010 FI1.3 31	2010 FG2.2 1
2011 FG3.3 $\frac{1}{2}$	2013 FI4.4 69	2015 HG8 454	2017 FG1.1 –1	2018 HG5 –15
2019 HI15 7	2019 FG2.2 6	2023 HG6 8		