Hong Kong Mathematics Olympiad (1991 – 92)
Sample Event (Individual)
香港数学竞赛 (1991 – 92)
决赛项目 – 样本 (个人)

(i) Given $A=(b^m)^n+b^{m+n}$. Find the value of A when $b=4$, $m=n=1$.

$A=$

已知 $A=(b^m)^n+b^{m+n}$。当 $b=4$，$m=n=1$ 时，求 A。

(ii) If $2^A=B^{10}$ and $B>0$, find B.

$B=$

若 $2^A=B^{10}$ 且 $B>0$，求 B。

(iii) Solve for C in the following equation :

$C=$

$$\sqrt{\frac{20B+45}{C}}=C$$

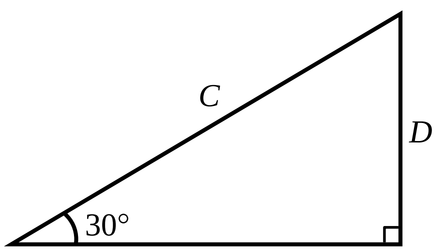
从下列方程求 C :

$$\sqrt{\frac{20B+45}{C}}=C$$

(iv) Find D in the figure.

$D=$

如图所示，求 D。



Hong Kong Mathematics Olympiad (1991 – 92)
Final Event 1 (Individual)
香港数学竞赛 (1991 – 92)
决赛项目 1 (个人)

(i) If the sum of the interior angles of an n-sided polygon is $1440°$, find n.

若一凸 n 边形之内角和为 $1440°$，求 n。

$n =$

(ii) If $x^2 - nx + a = 0$ has 2 equal roots, find a.

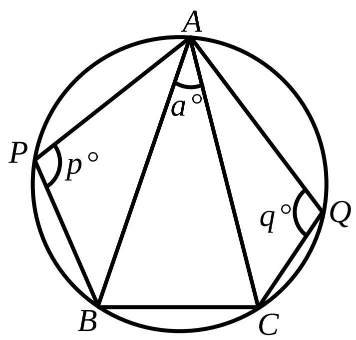
若 $x^2 - nx + a = 0$ 有两等根，求 a。

$a =$

(iii) In the figure, if $z = p + q$, find z.

如图所示，若 $z = p + q$，求 z。

$z =$



(iv) If $S = 1 + 2 - 3 - 4 + 5 + 6 - 7 - 8 + \cdots + z$, find S.

若 $S = 1 + 2 - 3 - 4 + 5 + 6 - 7 - 8 + \cdots + z$，求 S。

$S =$

Hong Kong Mathematics Olympiad (1991 – 92)

Final Event 2 (Individual)

香港数学竞赛 (1991 – 92)

决赛项目 2 (个人)

(i) If $ar = 24$ and $ar^4 = 3$, find a.

若 $ar = 24$ 及 $ar^4 = 3$，求 a。

$a =$

(ii) If $\left(x + \frac{a}{4}\right)^2 = x^2 + \frac{a}{2}x + b$, find b.

若 $\left(x + \frac{a}{4}\right)^2 = x^2 + \frac{a}{2}x + b$，求 b。

$b =$

(iii) If $c = \log_2 \frac{b}{9}$, find c.

若 $c = \log_2 \frac{b}{9}$，求 c。

$c =$

(iv) If $d = 12^c - 142^2$, find d.

若 $d = 12^c - 142^2$，求 d。

$d =$

Hong Kong Mathematics Olympiad (1991 – 92)
Final Event 3 (Individual)
香港数学竞赛 (1991 – 92)
决赛项目 3 (个人)

(i) If $a=\dfrac{\sin 15^\circ}{\cos 75^\circ}+\dfrac{1}{\sin^2 75^\circ}-\tan^2 15^\circ$, find a . | $a =$

若 $a=\dfrac{\sin 15^\circ}{\cos 75^\circ}+\dfrac{1}{\sin^2 75^\circ}-\tan^2 15^\circ$，求 a。

(ii) If the lines $ax+2y+1=0$ and $3x+by+5=0$ are perpendicular to each other, find b . | $b =$

若直线 $ax+2y+1=0$ 与 $3x+by+5=0$ 互相垂直，求 b。

(iii) The three points $(2, b)$, $(4, -b)$ and $(5, \frac{c}{2})$ are collinear. Find c . | $c =$

三点 $(2, b)$、$(4, -b)$ 及 $(5, \frac{c}{2})$ 共线，求 c。

(iv) If $\dfrac{1}{x}:\dfrac{1}{y}:\dfrac{1}{z}=3:4:5$ and $\dfrac{1}{x+y}:\dfrac{1}{y+z}=9c:d$, find d . | $d =$

若 $\dfrac{1}{x}:\dfrac{1}{y}:\dfrac{1}{z}=3:4:5$ 且 $\dfrac{1}{x+y}:\dfrac{1}{y+z}=9c:d$，求 d。

Hong Kong Mathematics Olympiad (1991 – 92)

Final Event 4 (Individual)

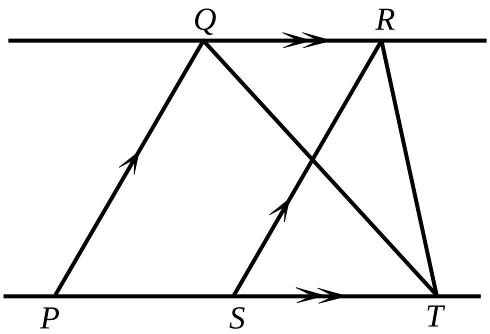
香港数学竞赛 (1991 – 92)

决赛项目 4 (个人)

(i) In the figure, the area of $PQRS$ is 80 cm^2. If the area of ΔQRT is $A \text{ cm}^2$, find A.

在图中，$PQRS$ 之面积为 80 cm^2。若 ΔQRT 之面积为 $A \text{ cm}^2$，求 A。

$A =$



(ii) If $B = \log_2\left(\frac{8A}{5}\right)$, find B.

若 $B = \log_2\left(\frac{8A}{5}\right)$，求 B。

$B =$

(iii) Given $x + \frac{1}{x} = B$. If $C = x^3 + \frac{1}{x^3}$, find C.

已知 $x + \frac{1}{x} = B$。若 $C = x^3 + \frac{1}{x^3}$，求 C。

$C =$

(iv) Let $(p, q) = qD + p$. If $(C, 2) = 212$, find D.

设 $(p, q) = qD + p$。若 $(C, 2) = 212$，求 D。

$D =$

Hong Kong Mathematics Olympiad (1991 – 92)
Final Event 5 (Individual)
香港数学竞赛 (1991 – 92)
决赛项目 5 (个人)

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

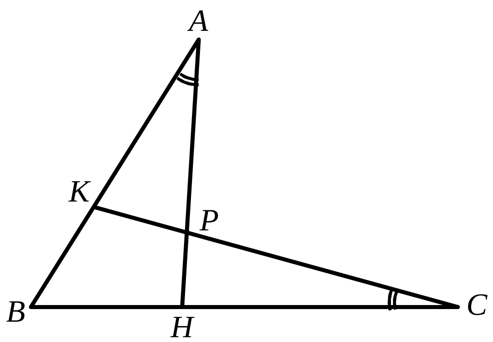
设 p, q 为二次方程 $x^2-3x-2=0$ 的两根，且 $a=p^3+q^3$，求 a。

$a =$

(ii) If $AH=a$, $CK=36$, $BK=12$ and $BH=b$, find b.

若 $AH=a$，$CK=36$，$BK=12$，$BH=b$，求 b。

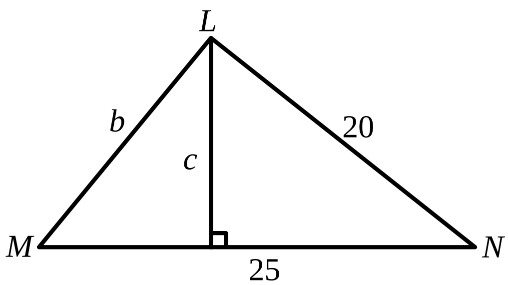
$b =$



(iii) Find c.

求 c。

$c =$



(iv) Let $\sqrt{2x+23}+\sqrt{2x-1}=c$ and $d=\sqrt{2x+23}-\sqrt{2x-1}$. Find d.

设 $\sqrt{2x+23}+\sqrt{2x-1}=c$ 及 $d=\sqrt{2x+23}-\sqrt{2x-1}$。求 d。

$d =$