

Hong Kong Mathematics Olympiad (1994 – 95)
Heat Event (Individual)
香港数学竞赛(1994 – 95)
初赛项目 (个人)

1. Find the positive square root of 1234567654321 .

求 1234567654321 的平方根。

2. Given that $f\left(\frac{1}{x}\right) = \frac{x}{1-x^2}$, find the value of $f(2)$.

已知 $f\left(\frac{1}{x}\right) = \frac{x}{1-x^2}$, 求 $f(2)$ 的值。

3. Solve $3^{2x} + 9 = 10 \cdot 3^x$.

解 $3^{2x} + 9 = 10 \cdot 3^x$ 。

4. A three-digit number is selected at random. Find the probability that the number selected is a perfect square.

随意抽出一个三位数。求这个数是一完全平方数的机会。

5. Given that $\sin x + \cos x = \frac{1}{5}$ and $0 \leq x \leq \pi$, find $\tan x$.

已知 $\sin x + \cos x = \frac{1}{5}$, 且 $0 \leq x \leq \pi$, 求 $\tan x$ 。

6. How many pairs of positive integers x, y are there satisfying $xy - 3x - 2y = 10$?

有多少对正整数 x, y 可满足 $xy - 3x - 2y = 10$?

7. Given x, y are positive integers and $3x + 5y = 123$. Find the least value of $|x - y|$.

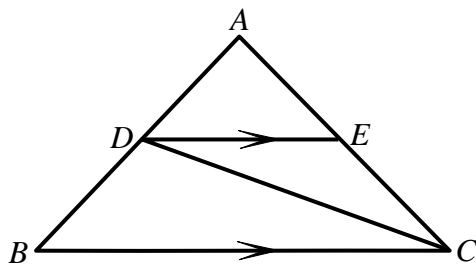
x, y 为正整数, 且 $3x + 5y = 123$ 。求 $|x - y|$ 的最小值。

8. Find the remainder when 1997^{913} is divided by 10 .

求 1997^{913} 被 10 除时所得的余数。

9. In the figure, if $BC = 3DE$, find the value of r where $r = \frac{\text{Area of } \triangle ADE}{\text{Area of } \triangle BDC}$.

下图中，若 $BC = 3DE$ ，求 r 的值，其中 $r = \frac{\text{Area of } \triangle ADE}{\text{Area of } \triangle BDC}$ 。



10. A, B, C, D are points on the sides of the right-angled triangle PQR as shown in the figure. If $ABCD$ is a square, $QA = 8$ and $BR = 18$, find AB .

如图所示， A, B, C, D 为直角三角形 PQR 各边上的点。若 $ABCD$ 为一正方形，且 $QA = 8$ 及 $BR = 18$ ，求 AB 。

