

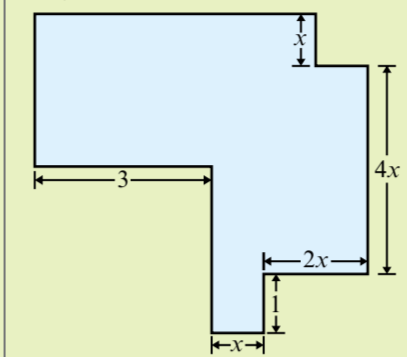
先天八卦圖(伏羲八卦圖) 與二進制數學

先天八卦圖是從 0 到 7 八個數字，由小到大，順序以二進制的書寫形式有規則的排列。從數學的角度來說，八卦與現在二進制數學沒有本質的區別，它所使用的字符是陽爻(—)和陰爻(--)，而非阿拉伯數字“0”和“1”。所以中國可說是最早使用二進制數學的國家。

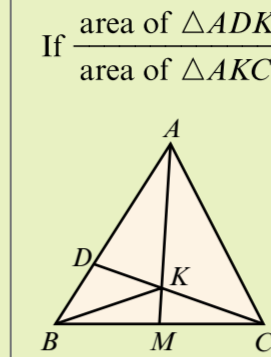


If $f(x) = x^2 + 13x$,
then $f(x-7) = x^2 - px - 42$. $p = ?$

In the figure, all the corners are right-angled. If the perimeter of the figure is 40, then $x = ?$



In the figure, M is the mid-point of BC and $AD = 2DB$. AM and CD intersect at K .
If $\frac{\text{area of } \triangle ADK}{\text{area of } \triangle AKC} = 2 : m$, then $m = ?$



AAA
AA
A Find digit A .
+ A
500

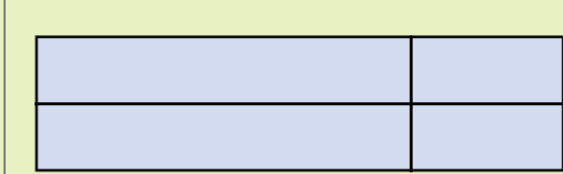
Given $\log_3(4x-2) - \log_3(x+1) = 1$, find x .

Given $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots = \frac{\pi^2}{x}$, find x .

If $\frac{13x+46}{12x^2-11x-15} = \frac{A}{3x-5} - \frac{5}{4x+3}$, find A .

Find the last digit of 2008^{2009} .

How many rectangles are there in the figure?



修改自醇酒醜酒《古算題》
肆中聽得語吟吟，薄酒名釀厚酒醇，
好酒一瓶醉三客，薄酒三瓶醉一人，
共且飲了一十九，三十三客醉醜醜，
試問高明能算士，幾多醇？

Given $1^3 + 2^3 + \dots + A^3 = (6A)^2$, find A .

5
初十

6
十一

7
十二

8
十三

9
十四

10
十五
耶穌受難節

11
十六
耶穌受難節翌日

Given $\frac{n}{0.n} + \frac{\sqrt{n}}{\sqrt{0.n}} = x$, find x .

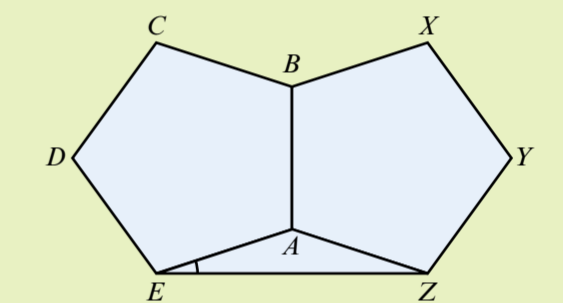
On a circular track, A and C are running in the same direction while B is in the opposite direction. If A passes C every 12 minutes, B meets C every 2 minutes and the distance that A running for 12 minutes equals to B running for 15 minutes. The ratio of the speeds between B and C is $x : 11$. Find x .

If $A = \begin{pmatrix} 3 & -2 \\ 1 & 4 \end{pmatrix}$, $A^{-1} = \begin{pmatrix} \frac{4}{n} & \frac{2}{n} \\ -\frac{1}{n} & \frac{3}{n} \end{pmatrix}$.
What is n ?

The product of the last digits of $(1^{2009} + 2^{2009} + \dots + 2009^{2009})$ and $(1^{2008} + 2^{2008} + \dots + 2009^{2008})$.

\overline{ABC} is an integer less than 500. When it is divided by 5, 9 and 7, the remainders are 4, 7 and 5, respectively. For the largest \overline{ABC} , find $A + B + C$.

Find the minimum value of $A + B + C$ if $\frac{4}{5} = \frac{1}{A} + \frac{1}{B} + \frac{1}{C}$.



12
十七
復活節

13
十八
復活節星期一

14
十九

15
二十

16
廿一

17
廿二

18
廿三
 $ABCDE$ and $ABXYZ$ are two identical regular pentagons. Find $\angle AEZ$.

Given $(\sqrt{2} + \sqrt{1})^{-1} + (\sqrt{3} + \sqrt{2})^{-1} + \dots + (\sqrt{400} + \sqrt{399})^{-1} = n$, find n .

Given $n^2 = 1 + 3 + 5 + \dots + 39$, find n .

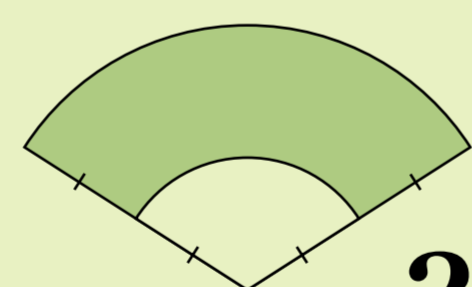
If area of the larger sector = 28, then area of the shaded region = ?

If A, B, C, D, E represent different digits, find $A + B + C + D + E$.

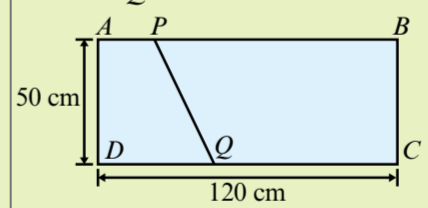
Given that X is a reduced fraction.
 $X + Y = \frac{7}{9}$ and $X - Y = \frac{1}{2}$.
Find the numerator of X .

Point P is moving from A to B with speed 2 cm/s. Point Q is moving from C to D with speed 3 cm/s. P and Q start moving at the same time. Find the time that $PQ \parallel AD$.

Find the last two digits of $5^{2009 \cdot 2009}$.



5 A D
C 5 5
+ D B C
A 5 E 5



19
廿四

20
廿五
穀雨

21
廿六

22
廿七

23
廿八

24
廿九

25
四月

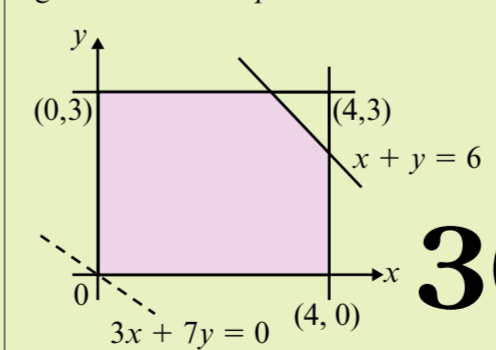
In hoopball, a field goal is worth 2 points and a foul shot is worth 1 point. Suppose a team scored 72 points and made 6 more field goals than foul shots. How many field goals did the team make?

If 3, $a, b, c, 15$ are in AP, then $a + b + c = ?$

How many non-negative integral solutions for $x + y + z = 6$.

葛卷裹表《古算題》
二丈木長三尺圍，葛生其下纏繞之，
徐徐纏繞七周遍，葛梢卻與木梢齊，
試問先生能算者，葛長多少請君題。

Let $p = 3x + 7y$. Under the constraints $0 \leq x \leq 4, 0 \leq y \leq 3, x + y \leq 6$, what is the greatest value of p ?



APRIL
四月 2009