

**2000 AMC8****Problem 1**

Aunt Anna is 42 years old. Caitlin is 5 years younger than Brianna, and Brianna is half as old as Aunt Anna. How old is Caitlin?

Anna 阿姨现在 42 岁, Caitlin 比 Brianna 小 5 岁, Brianna 的年龄是 Anna 阿姨的一半。问 Caitlin 多大?

- (A) 15      (B) 16      (C) 17      (D) 21      (E) 37

**Problem 2**

Which of these numbers is less than its reciprocal?

下面哪个数比它的倒数小?

- (A)  $-2$       (B)  $-1$       (C)  $0$       (D)  $1$       (E)  $2$

**Problem 3**

How many whole numbers lie in the interval between  $\frac{5}{3}$  and  $2\pi$ ?

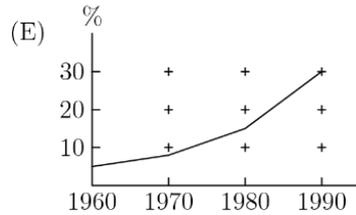
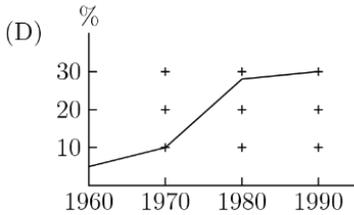
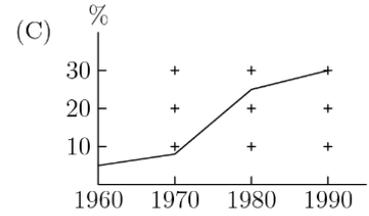
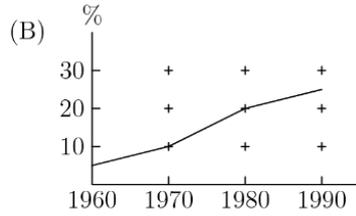
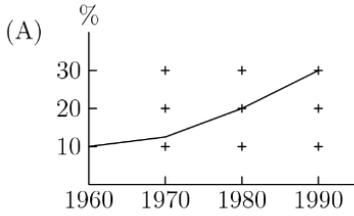
在  $\frac{5}{3}$  到  $2\pi$  之间有多少个整数?

- (A) 2      (B) 3      (C) 4      (D) 5      (E) infinitely many

## Problem 4

In 1960 only 5% of the working adults in Carlin City worked at home. By 1970 the "at-home" work force increased to 8%. In 1980 there were approximately 15% working at home, and in 1990 there were 30%. The graph that best illustrates this is

在1960年，Carlin 城市只有5%的劳动力在家办公，到1970年，在家办公的劳动力增加到了8%，在1980年，大概有15%的劳动力在家办公，在1990年，是30%。下面的图像中，最能体现这一点的是



## Problem 5

Each principal of Lincoln High School serves exactly one 3-year term. What is the maximum number of principals this school could have during an 8-year period?

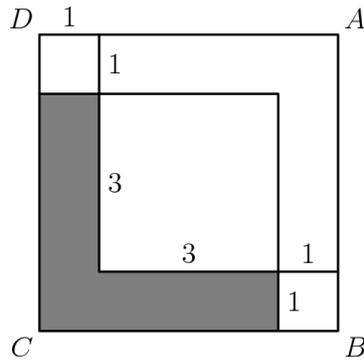
林肯高中的每一任校长任期恰好都是3年，那么在某个8年期内，这所学校最多可能有多少任校长？

- (A) 2      (B) 3      (C) 4      (D) 5      (E) 8

## Problem 6

Figure  $ABCD$  is a square. Inside this square three smaller squares are drawn with the side lengths as labeled. The area of the shaded  $L$ -shaped region is

$ABCD$ 是个正方形。在这个正方形内画了3个小正方形，它们的边长如图所示。则  $L$  形状的阴影部分区域的面积是多少？



- (A) 7    (B) 10    (C) 12.5    (D) 14    (E) 15

## Problem 7

What is the minimum possible product of three different numbers of the set  $\{-8, -6, -4, 0, 3, 5, 7\}$ ?

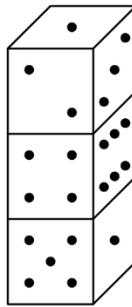
集合  $\{-8, -6, -4, 0, 3, 5, 7\}$  中的三个不同的元素的乘积的最小可能值是多少？

- (A)  $-336$     (B)  $-280$     (C)  $-210$     (D)  $-192$     (E) 0

**Problem 8**

Three dice with faces numbered 1 through 6 are stacked as shown. Seven of the eighteen faces are visible, leaving eleven faces hidden (back, bottom, between). The total number of dots NOT visible in this view is

3 个各个面上分别标有 1 到 6 的数字的骰子如图所示堆叠起来。18 个面只有 7 个面可见。其余 11 个面不可见（后面，底面以及两个骰子之间的面）。图示所示的角度所看不到的面上的点数总和是多少？



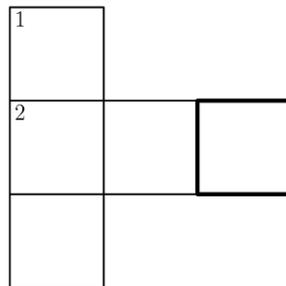
- (A) 21      (B) 22      (C) 31      (D) 41      (E) 53

**Problem 9**

Three-digit powers of 2 and 5 are used in this *cross-number* puzzle. What is the only possible digit for the outlined square?

在这个交叉数字拼图中使用了 2 和 5 的幂，且都是三位数。则黑体所示的正方形内唯一可能的数字是多少？

**ACROSS**      **DOWN**  
 $2 \cdot 2^m$        $1 \cdot 5^n$



ACROS | 横着    DOWN | 竖着

- (A) 0      (B) 2      (C) 4      (D) 6      (E) 8

## Problem 10

Ara and Shea were once the same height. Since then Shea has grown 20% while Ara has grown half as many inches as Shea. Shea is now 60 inches tall. How tall, in inches, is Ara now?

Ara 和 Shea 以前身高一样。自那以后，Shea 身高增高了 20%，而 Ara 增长的高度是 Shea 增长高度的一半。Shea 现在身高 60 英寸，那么 Ara 现在身高是多少英寸？

- (A) 48    (B) 51    (C) 52    (D) 54    (E) 55

## Problem 11

The number 64 has the property that it is divisible by its units digit. How many whole numbers between 10 and 50 have this property?

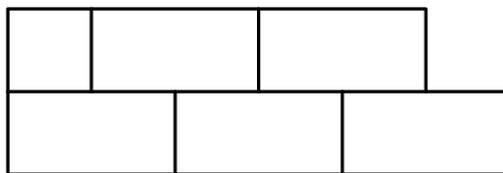
64 这个数有这样的性质：它可以被它的个位所整除，那么 10 和 50 之间有多少个整数有这样的性质？

- (A) 15    (B) 16    (C) 17    (D) 18    (E) 20

## Problem 12

A block wall 100 feet long and 7 feet high will be constructed using blocks that are 1 foot high and either 2 feet long or 1 foot long (no blocks may be cut). The vertical joins in the blocks must be staggered as shown, and the wall must be even on the ends. What is the smallest number of blocks needed to build this wall?

一堵墙 100 英尺长，7 英尺高，是由若干高度均为 1 英尺，长度为 2 英尺或者 1 英尺的砖块组成（不允许切割砖块）。砖块之间竖直的连接线必须如图所示交错开来，并且墙的两端要对齐。则要建造这堵墙，需要的最少砖块数是多少？

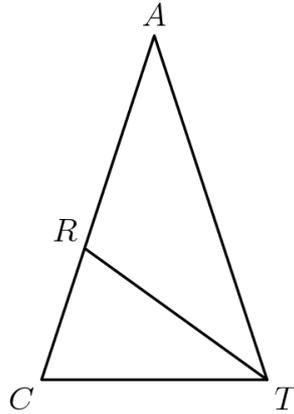


- (A) 344    (B) 347    (C) 350    (D) 353    (E) 356

## Problem 13

In triangle  $CAT$ , we have  $\angle ACT = \angle ATC$  and  $\angle CAT = 36^\circ$ . If  $\overline{TR}$  bisects  $\angle ATC$ , then  $\angle CRT =$

在三角形  $CAT$  中, 我们有  $\angle ACT = \angle ATC$ ,  $\angle CAT = 36^\circ$ 。若  $\overline{TR}$  平分  $\angle ATC$ , 则  $\angle CRT =$



- (A)  $36^\circ$     (B)  $54^\circ$     (C)  $72^\circ$     (D)  $90^\circ$     (E)  $108^\circ$

## Problem 14

What is the units digit of  $19^{19} + 99^{99}$ ?

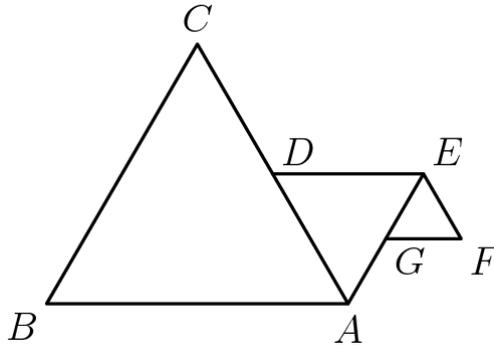
$19^{19} + 99^{99}$  的个位数字是多少?

- (A) 0    (B) 1    (C) 2    (D) 8    (E) 9

## Problem 15

Triangles  $ABC$ ,  $ADE$ , and  $EFG$  are all equilateral. Points  $D$  and  $G$  are midpoints of  $\overline{AC}$  and  $\overline{AE}$ , respectively. If  $AB = 4$ , what is the perimeter of figure  $ABCDEF$ ?

三角形  $ABC$ ,  $ADE$  和  $EFG$  都是等边三角形。点  $D$  和  $G$  分别是  $\overline{AC}$  和  $\overline{AE}$  的中点。若  $AB=4$ ，则图形  $ABCDEF$  的周长是多少？



- (A) 12      (B) 13      (C) 15      (D) 18      (E) 21

## Problem 16

In order for Mateen to walk a kilometer (1000m) in his rectangular backyard, he must walk the length 25 times or walk its perimeter 10 times. What is the area of Mateen's backyard in square meters?

为了让 Mateen 在他的长方形后院里走 1 公里 (1000 米)，他必须沿着长方形的长走 25 次，或者沿着它的周长走 10 次。那么 Mateen 后院的面积是多少平方米？

- (A) 40      (B) 200      (C) 400      (D) 500      (E) 1000

## Problem 17

The operation  $\otimes$  is defined for all nonzero numbers by  $a \otimes b = \frac{a^2}{b}$ .

Determine  $[(1 \otimes 2) \otimes 3] - [1 \otimes (2 \otimes 3)]$ .

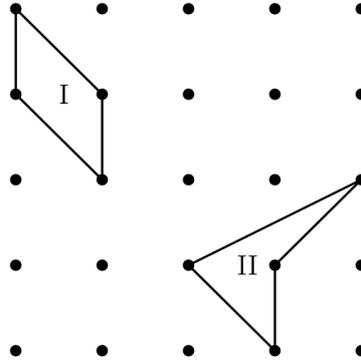
对于所有非零数，定义  $a \otimes b = \frac{a^2}{b}$ 。求  $[(1 \otimes 2) \otimes 3] - [1 \otimes (2 \otimes 3)]$  的值。

- (A)  $-\frac{2}{3}$       (B)  $-\frac{1}{4}$       (C) 0      (D)  $\frac{1}{4}$       (E)  $\frac{2}{3}$

## Problem 18

Consider these two geoboard quadrilaterals. Which of the following statements is true?

考虑下面几何画板上的两个四边形。下面哪句话是对的？

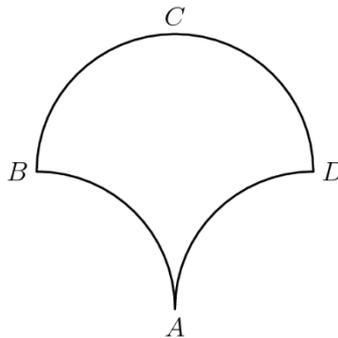


- (A) The area of quadrilateral I is more than the area of quadrilateral II. | 四边形 I 的面积大于四边形 II 的面积.
- (B) The area of quadrilateral I is less than the area of quadrilateral II. | 四边形 I 的面积小于四边形 II 的面积.
- (C) The quadrilaterals have the same area and the same perimeter. | 这两个四边形的面积相同.
- (D) The quadrilaterals have the same area, but the perimeter of I is more than the perimeter of II. | 这 2 个四边形有相同的面积, 但是 I 的周长大于 II 的周长.
- (E) The quadrilaterals have the same area, but the perimeter of I is less than the perimeter of II. | 这 2 个四边形有相同的面积, 但是 I 的周长小于 II 的周长.

## Problem 19

Three circular arcs of radius 5 units bound the region shown. Arcs  $AB$  and  $AD$  are quarter-circles, and arc  $BCD$  is a semicircle. What is the area, in square units, of the region?

三段半径为 5 个单位长的圆弧围成图示区域。弧  $AB$  和  $AD$  均为四分之一圆, 弧  $BCD$  是个半圆。那么这个区域的面积是多少平方单位?



- (A) 25      (B)  $10 + 5\pi$       (C) 50      (D)  $50 + 5\pi$       (E)  $25\pi$

## Problem 20

You have nine coins: a collection of pennies, nickels, dimes, and quarters having a total value of \$1.02, with at least one coin of each type. How many dimes must you have?

你有 9 枚硬币：若干便士，五分镍币，一角硬币和 25 分硬币，总价值是 1.02 美元，并且每种硬币都至少有一枚。那么你肯定有多少枚一角硬币？

- (A) 1      (B) 2      (C) 3      (D) 4      (E) 5

## Problem 21

Keiko tosses one penny and Ephraim tosses two pennies. The probability that Ephraim gets the same number of heads that Keiko gets is:

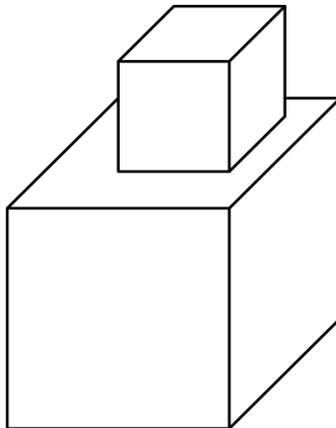
Keiko 掷了一枚便士，Ephraim 掷了两枚便士。Ephraim 得到的正面的个数和 Keiko 得到的正面的个数一样多的概率是：

- (A)  $\frac{1}{4}$       (B)  $\frac{3}{8}$       (C)  $\frac{1}{2}$       (D)  $\frac{2}{3}$       (E)  $\frac{3}{4}$

## Problem 22

A cube has edge length 2. Suppose that we glue a cube of edge length 1 on top of the big cube so that one of its faces rests entirely on the top face of the larger cube. The percent increase in the surface area (sides, top, and bottom) from the original cube to the new solid formed is closest to

一个正方体边长为 2。假设我们把一个边长为 1 的正方体粘贴到这个大的正方体的顶面，使得小正方体的一个面整个的放在大正方体的顶面上。则和原来大正方体的表面积（侧面，顶面，底面）相比较，所形成的新的立体图形的表面积增加的百分数最接近于百分之多少？



- (A) 10      (B) 15      (C) 17      (D) 21      (E) 25

## Problem 23

There is a list of seven numbers. The average of the first four numbers is 5, and the average of the last four numbers is 8. If the average of all seven numbers is  $6\frac{4}{7}$ , then the number common to both sets of four numbers is

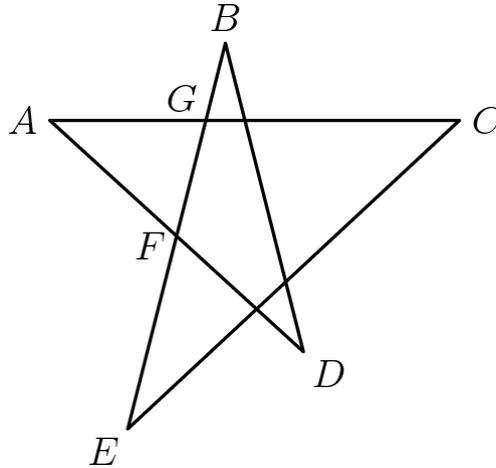
有一组 7 个数。前面 4 个数的平均值是 5，最后 4 个数的平均值是 8。若所有这 7 个数的平均值是  $6\frac{4}{7}$ ，那么前面 4 个数和最后 4 个数共同拥有的那个数是

- (A)  $5\frac{3}{7}$     (B) 6    (C)  $6\frac{4}{7}$     (D) 7    (E)  $7\frac{3}{7}$

## Problem 24

If  $\angle A = 20^\circ$  and  $\angle AFG = \angle AGF$ , then  $\angle B + \angle D =$

若  $\angle A = 20^\circ$ ， $\angle AFG = \angle AGF$ ，那么  $\angle B + \angle D =$

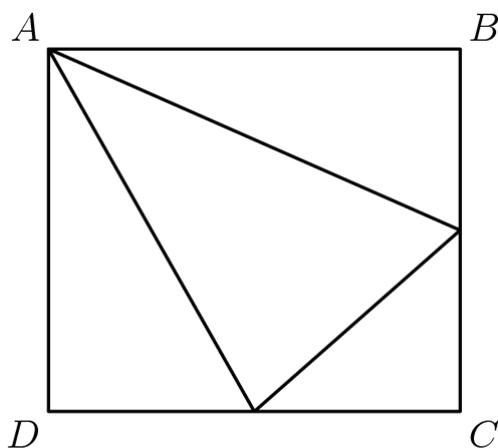


- (A)  $48^\circ$     (B)  $60^\circ$     (C)  $72^\circ$     (D)  $80^\circ$     (E)  $90^\circ$

## Problem 25

The area of rectangle  $ABCD$  is 72. If point  $A$  and the midpoints of  $\overline{BC}$  and  $\overline{CD}$  are joined to form a triangle, the area of that triangle is

矩形  $ABCD$  的面积是 72. 若点  $A$ ,  $\overline{BC}$  的中点和  $\overline{CD}$  的中点这 3 个点相连, 形成一个三角形, 则这个三角形的面积是



- (A) 21    (B) 27    (C) 30    (D) 36    (E) 40

## 2000 AMC 8 Answer Key

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
B	A	D	E	C	A	B	D	D	E	C	D	C
<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	
D	C	C	A	E	C	A	B	C	B	D	B	

## 2000 AMC 8 Solution



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