2015 MAA AMC8

Problem 1

How many square yards of carpet are required to cover a rectangular floor that is 12 feet long and 9 feet wide? (There are 3 feet in a yard.)

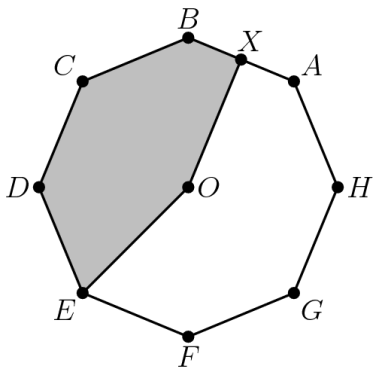
要覆盖长 12 英尺，宽 9 英尺的长方形地板，需要多少平方码的地毯？（1 码等于 3 英尺）

(A) 12 (B) 36 (C) 108 (D) 324 (E) 972

Problem 2

Point O is the center of the regular octagon $ABCDEFGH$, and X is the midpoint of the side $\overline{AB}$. What fraction of the area of the octagon is shaded?

点 O 是正八边形 ABCDEFGH 的中心，X 是边$\overline{AB}$的中点，问在整个八边形面积中，图中阴影部分面积所占的比例是多少？



(A) $\frac{11}{32}$ (B) $\frac{3}{8}$ (C) $\frac{13}{32}$ (D) $\frac{7}{16}$ (E) $\frac{15}{32}$

Problem 3

Jack and Jill are going swimming at a pool that is one mile from their house. They leave home simultaneously. Jill rides her bicycle to the pool at a constant speed of 10 miles per hour. Jack walks to the pool at a constant speed of 4 miles per hour. How many minutes before Jack arrives does Jill arrive?

Jack 和 Jill 要去距离他们家 1 英里的游泳池去游泳。他们同时从家出发。Jill 以 10

英里每小时的速度骑车去泳池，Jack 以 4 英里每小时的速度走过去。那么 Jill 比 Jack 早到多少分钟?

(A) 5　(B) 6　(C) 8　(D) 9　(E) 10

Problem 4

The Centerville Middle School chess team consists of two boys and three girls. A photographer wants to take a picture of the team to appear in the local newspaper. She decides to have them sit in a row with a boy at each end and the three girls in the middle. How many such arrangements are possible?

Centerville 中学的国际象棋队由 2 个男生和 3 个女生组成。一家报社的摄影师想给他们拍张照片放到报纸上。她决定让他们坐成一排，需要 2 个男生坐两端，3 个女生坐中间。一共有多少种可能的安排方法?

(A) 2　(B) 4　(C) 5　(D) 6　(E) 12

Problem 5

Billy's basketball team scored the following points over the course of the first 11 games of the season:

$$42,47,53,53,58,58,58,61,64,65,73.$$

If his team scores 40 in the 12th game, which of the following statistics will show an increase?

Billy 的篮球队在本季度前 11 场比赛中的得分分别是:

$$42,47,53,53,58,58,58,61,64,65,73.$$

若他的篮球队在第 12 场比赛中得到 40 分，那么下面哪个统计数据会升高?

(A) Range | 极差　(B) Median | 中位数　(C) Mean | 平均数
(D) Mode | 众数　(E) Mid-range | 中程数

Problem 6

In $\triangle ABC$, $AB = BC = 29$, and $AC = 42$. What is the area of $\triangle ABC$?

在△ABC 中，$AB = BC = 29$，$AC = 42$. 则 △ABC的面积是多少?

(A) 100 (B) 420 (C) 500 (D) 609 (E) 701

Problem 7

Each of two boxes contains three chips numbered 1, 2, 3. A chip is drawn randomly from each box and the numbers on the two chips are multiplied. What is the probability that their product is even?

有两个盒子，每个盒子内都有分别标有 1，2，3 的三个筹码。从每个盒子里都随机抽取一个筹码，并把上面标的数字相乘，那么乘积是偶数的概率是多少?

(A) $\frac{1}{9}$ (B) $\frac{2}{9}$ (C) $\frac{4}{9}$ (D) $\frac{1}{2}$ (E) $\frac{5}{9}$

Problem 8

What is the smallest whole number larger than the perimeter of any triangle with a side of length 5 and a side of length 19?

一个三角形的其中两条边长度分别是 5 和 19，那么大于这个三角形周长的最小整数是多少?

(A) 24 (B) 29 (C) 43 (D) 48 (E) 57

Problem 9

On her first day of work, Janabel sold one widget. On day two, she sold three widgets. On day three, she sold five widgets, and on each succeeding day, she sold two more widgets than she had sold on the previous day. How many widgets in total had Janabel sold after working 20 days?

Janabel 在她上班的第一天卖出了 1 个器具，第二天卖出了 3 个器具，第三天卖出了 5 个器具，且在往后的每一天，她都比前一天多卖出 2 个器具，那么当她工作了 20 天后，共卖出多少个器具?

(A) 39 (B) 40 (C) 210 (D) 400 (E) 401

Problem 10

How many integers between 1000 and 9999 have four distinct digits?

1000 和 9999 之间有多少个四位数，满足这个数的四个位上数字都不相同?

(A) 3024 (B) 4536 (C) 5040 (D) 6480 (E) 6561

Problem 11

In the small country of Mathland, all automobile license plates have four symbols. The first symbol must be a vowel (A, E, I, O or U), the second and third symbols must be two different letters among the 21 non-vowels in the alphabet, and the fourth symbol must be a digit (0 through 9). If the symbols are chosen at random subject to these conditions, what is the probability (In fractions) that the plate will read "$AMC8$"?

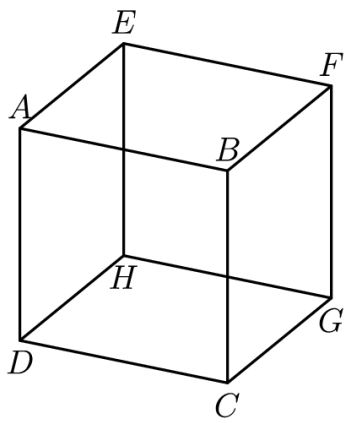
在 Mathland 这个小国家，所有汽车的牌照都有 4 个符号。第一个符号必须是个韵母（A，E，I，O 或 U），第二个和第三个符号必须是 21 个非韵母中不同的两个字母，第四个必须是一个数字（0 到 9），如果符号都是按照这些规则随机选择的，那么牌照上显示的是“AMC8”概率是多少?

(A) $\frac{1}{22,050}$ (B) $\frac{1}{21,000}$ (C) $\frac{1}{10,500}$ (D) $\frac{1}{2,100}$ (E) $\frac{1}{1,050}$

Problem 12

How many pairs of parallel edges, such as $\overline{AB}$, and $\overline{GH}$, or $\overline{EH}$, and $\overline{FG}$, does a cube have? Repeating parallel edges do not count toward the final answer.

在一个正方体中有多少对平行的棱（例如$\overline{AB}$和$\overline{GH}$，或者$\overline{EH}$和$\overline{FG}$）？



(A) 6 (B) 12 (C) 18 (D) 24 (E) 36

Problem 13

How many subsets of two elements can be removed from the set {1,2,3,4,5,6,7,8,9,10,11} so that the mean (average) of the remaining numbers is 6?

有多少个两元素的子集可以从集合{1,2,3,4,5,6,7,8,9,10,11}中移走，使得集合中剩下的元素的平均值是 6?

(A) 1 (B) 2 (C) 3 (D) 5 (E) 6

Problem 14

Which of the following integers cannot be written as the sum of four consecutive odd integers?

下面哪个整数无法写成 4 个连续奇数之和?

(A) 16 (B) 40 (C) 72 (D) 100 (E) 200

Problem 15

At Euler Middle School, 198 students voted on two issues in a school referendum with the following results: 149 voted in favor of the first issue and 119 voted in favor of the second issue. If there were exactly 29 students who voted against both issues, how many students voted in favor of both issues?

在 Euler 中学，198 名学生参与了一次针对两项议题的全校投票，结果如下：149 名学生赞成第一项议题，119 名学生赞成第二项议题。如果恰好有 29 名学生对这两项议题都反对，那么有多少名学生对这两项议题都赞成?

(A) 49 (B) 70 (C) 79 (D) 99 (E) 149

Problem 16

In a middle-school mentoring program, a number of the sixth graders are

paired with a ninth-grade student as a buddy. No ninth grader is assigned more than one sixth-grade buddy. If $\frac{1}{3}$ of all the ninth graders are paired with $\frac{2}{5}$ of all the sixth graders, what fraction of the total number of sixth and ninth graders have a buddy?

在一所中学的一项导师项目中，由六年级学生和九年级学生成对组队完成项目。每个九年级学生都不能和超过 1 个六年级学生组成队友。如果$\frac{1}{3}$的所有九年级学生和$\frac{2}{5}$的所有六年级成对，那么已经组成队友的学生占了六年级和九年级总人数的比例是多少？

(A) $\frac{2}{15}$ (B) $\frac{4}{11}$ (C) $\frac{11}{30}$ (D) $\frac{3}{8}$ (E) $\frac{11}{15}$

Problem 17

Jeremy's father drives his son to school in rush hour traffic in 20 minutes. One day, there is no traffic, so his father can drive him 18 miles per hour faster and gets him to school in 12 minutes. How far in miles is it to school?

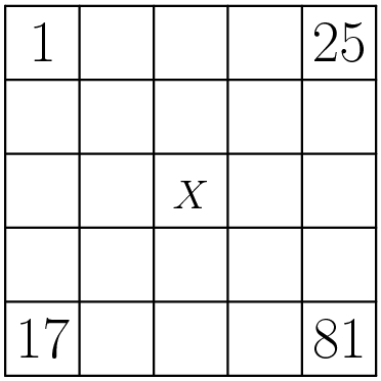
Jeremy 的爸爸在交通高峰期把他送到学校需要 20 分钟。这一天路上车不多，因此他爸爸开车的速度提高了 18 英里每小时，把他送到学校花了 12 分钟，那么从他家到学校的距离有多少英里？

(A) 4 (B) 6 (C) 8 (D) 9 (E) 12

Problem 18

An arithmetic sequence is a sequence in which each term after the first is obtained by adding a constant to the previous term. For example, 2，5，8，11，14 is an arithmetic sequence with five terms, in which the first term is 2 and the constant added is 3. Each row and each column in this 5×5 array is an arithmetic sequence with five terms. The square in the center is labelled X as shown. What is the value of X?

一个等差数列是这样一种数列：第一项后面的每一项，都可以通过把前面一项加上一个常数得到。例如，2，5，8，11，14 是个 5 项的等差数列，其中第 1 项是 2，所加的常数是 3．下图所示的5×5 的方阵中，每一行每一列都是 5 项的等差数列。正方形中心的数字标记为X，问X的值是多少？

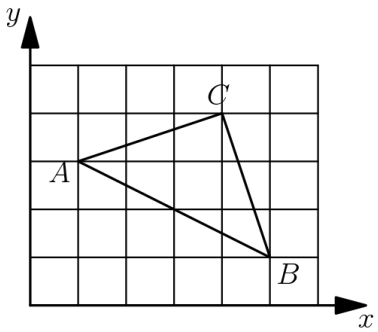


(A) 21 (B) 31 (C) 36 (D) 40 (E) 42

Problem 19

A triangle with vertices as $A = (1,3)$, $B = (5,1)$, and $C = (4,4)$ is plotted on a 6×5 grid. What fraction of the grid is covered by the triangle?

三个顶点为$A = (1,3), B = (5,1), C = (4,4)$的三角形画在一张$6 \times 5$的方格纸上，这张方格纸上被三角形覆盖的面积所占总面积的比例是多少?



(A) $\frac{1}{6}$ (B) $\frac{1}{5}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

Problem 20

Ralph went to the store and bought 12 pairs of socks for a total of $24. Some of the socks he bought cost $1 a pair, some of the socks he bought cost $3 a pair, and some of the socks he bought cost $4 a pair. If he bought at least one pair of each type, how many pairs of $1 socks did Ralph buy?

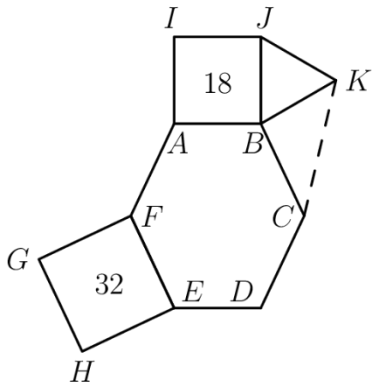
Ralph 去商店买了 12 双袜子，总共花了 24 美元。在她买的这些袜子中，有的是 1 美元一双，有的是 3 美元一双，还有的是 4 美元一双。如果她每种袜子都至少买了 1 双，那么 1 美元一双的袜子她买了多少双?

(A) 4　　(B) 5　　(C) 6　　(D) 7　　(E) 8

Problem 21

In the given figure hexagon $ABCDEF$ is equiangular, $ABJI$ and $FEHG$ are squares with areas 18 and 32 respectively, $\triangle JBK$ is equilateral and $FE = BC$. What is the area of $\triangle KBC$?

如图所示，六边形 ABCDEF 是个等角六边形，ABJI 和 FEHG 是面积分别为 18 和 32 的正方形。$\triangle JBK$是等边三角形，且 FE=BC，则$\triangle KBC$的面积是多少?



(A) $6\sqrt{2}$　　(B) 9　　(C) 12　　(D) $9\sqrt{2}$　　(E) 32

Problem 22

On June 1, a group of students are standing in rows, with 15 students in each row. On June 2, the same group is standing with all of the students in one long row. On June 3, the same group is standing with just one student in each row. On June 4, the same group is standing with 6 students in each row. This process continues through June 12 with a different number of students per row each day. However, on June 13, they cannot find a new way of organizing the students. What is the smallest possible number of students in the group?

7 月 1 号那天，一群学生站成几行，每行 15 个学生；7 月 2 号那天，这群学生站成一行；7 月 3 号那天，这群学生站成若干行，每行只有 1 个学生；7 月 4 号那天，这群学生站成若干行，每行 6 个学生。这个过程一直持续到 7 月 12 号，每天每行的人数都不一样。然而，到了 7 月 13 号这天，他们再也没有办法找到一种新的方式去安排这些学生，那么这群学生最少有多少人?

(A) 21 (B) 30 (C) 60 (D) 90 (E) 1080

Problem 23

Tom has twelve slips of paper which he wants to put into five cups labeled A, B, C, D, E. He wants the sum of the numbers on the slips in each cup to be an integer. Furthermore, he wants the five integers to be consecutive and increasing from A to E. The numbers on the papers are 2, 2, 2, 2.5, 2.5, 3, 3, 3, 3, 3.5, 4, and 4.5. If a slip with 2 goes into cup E and a slip with 3 goes into cup B, then the slip with 3.5 must go into what cup?

Tom 想把 12 张纸条放进 5 个标有 A，B，C，D，E 的杯子中。他希望每个杯子中的纸条上的数字之和均为整数。并且，他希望这 5 个整数是连续的整数，从 A 到 E 递增。这 12 张纸条上的数字分别是 2，2，2，2.5，2.5，3，3，3，3，3.5，4，4.5. 如果写有 2 的那张纸条放进了杯子 E，写有 3 的那张纸条放进了杯子 B，那么写有 3.5 的那张纸一定放进了哪个杯子?

(A) A (B) B (C) C (D) D (E) E

Problem 24

A baseball league consists of two four-team divisions. Each team plays every other team in its division N games. Each team plays every team in the other division M games with $N > 2M$ and $M > 4$. Each team plays a 76-game schedule. How many games does a team play within its own division?

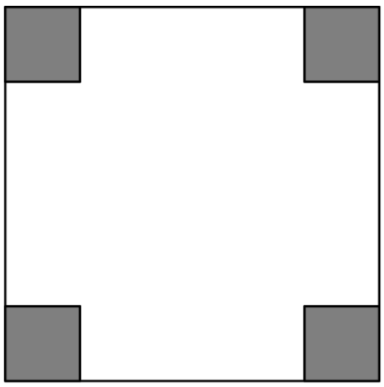
一个棒球联盟有两组组成，每组 4 支队伍。每组里面的每支队伍和自己组内的其他每支队伍都打N场比赛。每支队伍和另一组的每支队伍都打M场比赛，且 $N > 2M$，$M > 4$，每支队伍共需要打 76 场比赛，那么每支队伍和自己组内的队伍共需要打多少场比赛?

(A) 36 (B) 48 (C) 54 (D) 60 (E) 72

Problem 25

One-inch squares are cut from the corners of this 5 inch square. What is the area in square inches of the largest square that can fit into the remaining space?

从边长为 5 英寸的大正方形的四个角落裁去 4 个边长为 1 英寸的小正方形，则能够放入剩余图形中的最大正方形的面积是多少平方英寸?



(A) 9　　(B) $12\frac{1}{2}$　　(C) 15　　(D) $15\frac{1}{2}$　　(E) 17

2015 AMC 8 Answer Key												
题目	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
答案	A	D	D	E	A	B	E	D	D	B	B	C	D
题目	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
答案	D	D	B	D	B	A	D	C	C	D	B	C	

2015 AMC8 Solution

扫码观看视频解析