2017 MAA AMC8

Problem 1

Which of the following values is the largest?

下面哪个值是最大的?

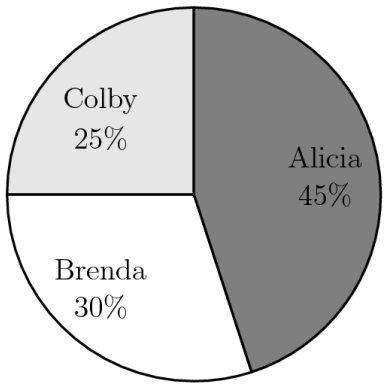
(A) $2+0+1+7$ (B) $2\times0+1+7$ (C) $2+0\times1+7$

(D) $2+0+1\times7$ (E) $2\times0\times1\times7$

Problem 2

Alicia, Brenda, and Colby were the candidates in a recent election for student president. The pie chart below shows how the votes were distributed among the three candidates. If Brenda received 36 votes, then how many votes were cast all together?

Alicia, Brenda 和 Colby 是最近的一次竞选学生主席的 3 个候选人。下面的饼图显示了这 3 人候选人的投票分布。若 Brenda 得到了 36 票，那么总共投了多少票?



(A) 70 (B) 84 (C) 100 (D) 106 (E) 120

Problem 3

What is the value of the expression $\sqrt{16\sqrt{8\sqrt{4}}}$?

表达式$\sqrt{16\sqrt{8\sqrt{4}}}$的值是多少?

(A) 4 (B) $4\sqrt{2}$ (C) 8 (D) $8\sqrt{2}$ (E) 16

Problem 4

When 0.000315 is multiplied by 7,928,564 the product is closest to which of the following?

当 0.000315 乘以 7,928,564，乘积最接近下面哪个数?

(A) 210 (B) 240 (C) 2100 (D) 2400 (E) 24000

Problem 5

What is the value of the expression

下面表达式的值为多少

$$\frac{1\cdot 2\cdot 3\cdot 4\cdot 5\cdot 6\cdot 7\cdot 8}{1+2+3+4+5+6+7+8}?$$

(A) 1020 (B) 1120 (C) 1220 (D) 2240 (E) 3360

Problem 6

If the degree measures of the angles of a triangle are in the ratio 3: 3: 4, what is the degree measure of the largest angle of the triangle?

如果一个三角形的三个角度数之比为 3：3：4，那么这个三角形的最大的角是多少度?

(A) 18 (B) 36 (C) 60 (D) 72 (E) 90

Problem 7

Let Z be a 6-digit positive integer, such as 247247, whose first three digits are the same as its last three digits taken in the same order. Which of the following numbers must also be a factor of Z?

Z 表示一个 6 位的正整数，例如 247247，从左往右前三位数字和后三位的数字一样。下面哪个数一定也是 Z 的一个因子?

(A) 11 (B) 19 (C) 101 (D) 111 (E) 1111

Problem 8

Malcolm wants to visit Isabella after school today and knows the street where she lives but doesn't know her house number. She tells him, "My house number has two digits, and exactly three of the following four statements about it are true."

(1) It is prime.

(2) It is even

(3) It is divisible by 7.

(4) One of its digits is 9.

This information allows Malcolm to determine Isabella's house number. What is its units digit?

今天放学后 Malcolm 准备访问 Isabella，他知道 Isabella 住的街道号，但不知道门牌号。Isabella 告诉他："我的门牌号是个两位数，并且下面的 4 个关于我家门牌号的论断，恰好只有 3 个是对的。"

（1）它是质数。

（2）它是偶数。

（3）它能被 7 整除。

（4）其中一个数字是 9。

这些信息可以让 Malcolm 确定 Isabella 的门牌号。那么门牌号的个位数字是多少？

(A) 4 (B) 6 (C) 7 (D) 8 (E) 9

Problem 9

All of Marcy's marbles are blue, red, green, or yellow. One third of her marbles are blue, one fourth of them are red, and six of them are green. What is the smallest number of yellow marbles?

Marcy 的玻璃球只有蓝色，红色，绿色和黄色这 4 种颜色。她的玻璃缘的三分之

一是蓝色，四分之一是红色，6 个玻璃球是绿色，那么黄色玻璃球的最小数目是多少个?

(A) 1　(B) 2　(C) 3　(D) 4　(E) 5

Problem 10

A box contains five cards, numbered 1, 2, 3, 4, and 5. Three cards are selected randomly without replacement from the box. What is the probability that 4 is the largest value selected?

一个盒子装了标有 1, 2, 3, 4, 5 的 5 张卡片。从中不放回的随机选择 3 张卡片，问 4 是选择的最大的数的概率是多少?

(A) $\frac{1}{10}$　(B) $\frac{1}{5}$　(C) $\frac{3}{10}$　(D) $\frac{2}{5}$　(E) $\frac{1}{2}$

Problem 11

A square-shaped floor is covered with congruent square tiles. If the total number of tiles that lie on the two diagonals is 37, how many tiles cover the floor?

一个正方形的地板由一些全等的方形瓷砖覆盖。若两条对角线上的瓷砖总个数是 37，那么铺这个地板总共用了多少块瓷砖?

(A) 148　(B) 324　(C) 361　(D) 1296　(E) 1369

Problem 12

The smallest positive integer greater than 1 that leaves a remainder of 1 when divided by 4, 5, and 6 lies between which of the following pairs of numbers?

大于 1 且除以 4，5 和 6 所得余数均为 1 的最小正整数在下面哪两个数之间?

(A) 2 and 19　(B) 20 and 39　(C) 40 and 59　(D) 60 and 79

(E) 80 and 124

Problem 13

Peter, Emma, and Kyler played chess with each other. Peter won 4 games and lost 2 games. Emma won 3 games and lost 3 games. If Kyler lost 3 games, how many games did he win?

Peter，Emma 和 Kyler 相互之间下棋。Peter 赢了 4 局，输了 2 局，Emma 赢了 3 局，输了 3 局，如果 Kyler 输了 3 局，那么他赢了几局?

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

Problem 14

Chloe and Zoe are both students in Ms. Demeanor's math class. Last night, they each solved half of the problems in their homework assignment alone and then solved the other half together. Chloe had correct answers to only 80% of the problems she solved alone, but overall 88% of her answers were correct. Zoe had correct answers to 90% of the problems she solved alone. What was Zoe's overall percentage of correct answers?

Chloe 和 Zoe 都是 Demeanor 女士数学课上的学生。昨晚她俩各自解决了家庭作业上一半的题目，接着共同解决了剩下的一半。Chloe 自己单独解决的题目里，正确率是 80%，但算上共同完成的题目，总的来说，她的正确率是 88%。Zoe 自己单独解决的题目里，正确率是 90%，问总的来说，Zoe 的正确率是多少?

(A) 89 (B) 92 (C) 93 (D) 96 (E) 98

Problem 15

In the arrangement of letters and numerals below, by how many different paths can one spell AMC8? Beginning at the A in the middle, a path allows only moves from one letter to an adjacent (above, below, left, or right, but not diagonal) letter. One example of such a path is traced in the picture.

在下图所示的字母和数字的排布中，拼写出 AMC8 有多少种方法? 要求从中间的 A 开始，移动的路径只允许从一个字母移到和这个字母相邻的字母（上，下，左，右，但不允许是对角线）。一种可能的路径标示在图中。

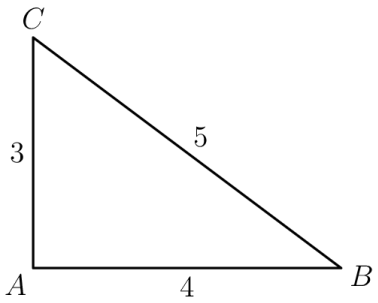
	8	C	8	
8	C	M	C	8
C	M	A	M	C
8	C	M	C	8
	8	C	8	

(A) 8 (B) 9 (C) 12 (D) 24 (E) 36

Problem 16

In the figure below, choose point D on $\overline{BC}$ so that $\triangle ACD$ and $\triangle ABD$ have equal perimeters. What is the area of $\triangle ABD$?

如下图所示,在边 $\overline{BC}$ 上选择一个点 D,使得 $\triangle ACD$ 和 $\triangle ABD$ 的周长相等。那么 $\triangle ABD$ 的面积是多少?



(A) $\frac{3}{4}$ (B) $\frac{3}{2}$ (C) 2 (D) $\frac{12}{5}$ (E) $\frac{5}{2}$

Problem 17

Starting with some gold coins and some empty treasure chests, I tried to put 9 gold coins in each treasure chest, but that left 2 treasure chests empty. So instead I put 6 gold coins in each treasure chest, but then I had 3 gold coins left over. How many gold coins did I have?

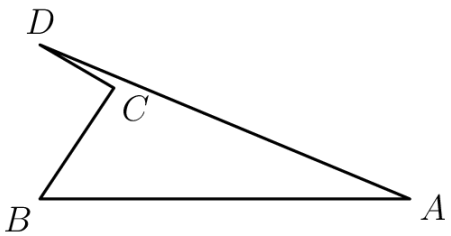
我有一些金币和若干财宝箱。我尝试在每个财宝箱里放 9 枚金币，那么还剩 2 个财宝箱是空的。若我在每个财宝箱里放 6 枚金币，那么还剩 3 枚金币无处可放。问我有多少枚金币?

(A) 9　　(B) 27　　(C) 45　　(D) 63　　(E) 81

Problem 18

In the non-convex quadrilateral $ABCD$ shown below, $\angle BCD$ is a right angle, $AB = 12$, $BC = 4$, $CD = 3$, and $AD = 13$.What is the area of quadrilateral $ABCD$?

在如下图所示的非凸四边形 ABCD 中，$\angle BCD$是个直角，且$AB = 12$，$BC = 4$，$CD = 3$，$AD = 13$。那么四边形$ABCD$的面积是多少？



(A) 12　　(B) 24　　(C) 26　　(D) 30　　(E) 36

Problem 19

For any positive integer M, the notation $M!$ denotes the product of the integers 1 through M. What is the largest integer n for which 5^n is a factor of the sum $98! + 99! + 100!$?

对于任何正整数M来说，符号$M!$表示从 1 到M的所有整数的乘积。使得5^n是$98! + 99! + 100!$的一个因子的最大整数n是多少？

(A) 23　　(B) 24　　(C) 25　　(D) 26　　(E) 27

Problem 20

An integer between 1000 and 9999, inclusive, is chosen at random. What is the probability that it is an odd integer whose digits are all distinct?

从 1000 到 9999 之间（包含 1000 和 9999）随机选择一个整数，问这个数是一个各个位上数字都不一样的奇数的概率是多少？

(A) $\frac{14}{75}$　　(B) $\frac{56}{225}$　　(C) $\frac{107}{400}$　　(D) $\frac{7}{25}$　　(E) $\frac{9}{25}$

Problem 21

Suppose a, b, and c are nonzero real numbers, and $a+b+c=0$. What are the possible value(s) for $\frac{a}{|a|}+\frac{b}{|b|}+\frac{c}{|c|}+\frac{abc}{|abc|}$?

假设a, b, c均为非零实数，且$a+b+c=0$，那么表达式$\frac{a}{|a|}+\frac{b}{|b|}+\frac{c}{|c|}+\frac{abc}{|abc|}$的可能值是哪些?

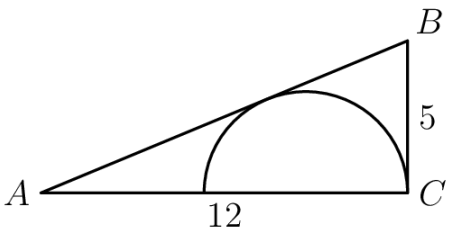
(A) 0 (B) 1 and -1 (C) 2 and -2 (D) 0, 2, and -2

(E) 0, 1, and -1

Problem 22

In the right triangle ABC, $AC=12$, $BC=5$, and angle C is a right angle. A semicircle is inscribed in the triangle as shown. What is the radius of the semicircle?

在直角三角形ABC中，$AC=12$，$BC=5$，且角C是个直角。一个半圆如下图所示内切于三角形中，那么这个半圆的半径是多少?



(A) $\frac{7}{6}$ (B) $\frac{13}{5}$ (C) $\frac{59}{18}$ (D) $\frac{10}{3}$ (E) $\frac{60}{13}$

Problem 23

Each day for four days, Linda traveled for one hour at a speed that resulted in her traveling one mile in an integer number of minutes. Each day after the first, her speed decreased so that the number of minutes to travel one mile increased by 5 minutes over the preceding day. Each of the four days, her distance traveled was also an integer number of miles. What was the total number of miles for the four trips?

四天里的每一天，Linda 每天都旅行 1 小时，并且每天的旅行速度都满足这样的要求：保证旅行 1 英里所花的分钟数都是整数。第一天之后的每一天，她的速度

不断降低，使得旅行 1 英里后一天所花的分钟数比前一天多 5 分钟。这 4 天的每一天，她所旅行的路程也都是个整数。那么这 4 天的总路程是多少英里？

(A) 10　(B) 15　(C) 25　(D) 50　(E) 82

Problem 24

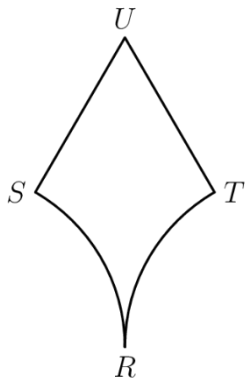
Mrs. Sanders has three grandchildren, who call her regularly. One calls her every three days, one calls her every four days, and one calls her every five days. All three called her on December 31, 2016. On how many days during the next year did she not receive a phone call from any of her grandchildren?

Sanders 女士有 3 个定期给她打电话的孙子．其中一个每三天通话一次，一个每四天通话一次，还有一个每五天通话一次。这 3 个孙子在 2016 年 12 月 31 号这天同时给她通了话。问下一年中有多少天她一个电话也没收到？

(A) 78　(B) 80　(C) 144　(D) 146　(E) 152

Problem 25

In the figure shown, $\overline{US}$ and $\overline{UT}$ are line segments each of length 2, and $m\angle TUS = 60^\circ$. Arcs $\widehat{TR}$ and $\widehat{SR}$ are each one-sixth of a circle with radius 2. What is the area of the region shown?



(A) $3\sqrt{3}-\pi$　(B) $4\sqrt{3}-\frac{4\pi}{3}$　(C) $2\sqrt{3}$　(D) $4\sqrt{3}-\frac{2\pi}{3}$

(E) $4+\frac{4\pi}{3}$

2017 AMC 8 Answer Key													
题目	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
答案	A	E	C	D	B	D	A	D	D	C	C	D	B
题目	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
答案	C	D	D	C	B	D	B	A	D	C	D	B	

2017 AMC8 Solution

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