2016 MAA AMC8

Problem 1

The longest professional tennis match lasted a total of 11 hours and 5 minutes. How many minutes is that?

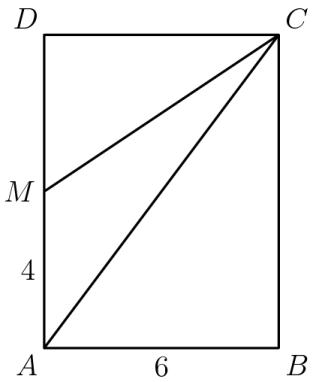
时间最长的职业网球赛总共持续了 11 小时 5 分钟。问一共多少分钟?

(A) 605 (B) 655 (C) 665 (D) 1005 (E) 1105

Problem 2

In rectangle $ABCD$, $AB = 6$ and $AD = 8$. Point M is the midpoint of $\overline{AD}$. What is the area of $\triangle AMC$?

在矩形 $ABCD$ 中，$AB = 6$，$AD = 8$，点 M是$\overline{AD}$的中点。那么$\triangle AMC$面积是多少?



(A) 12 (B) 15 (C) 18 (D) 20 (E) 24

Problem 3

Four students take an exam. Three of their scores are 70, 80, and 90. If the average of their four scores is 70, then what is the remaining score?

4 个学生参加一个考试。其中 3 个的分数是 70，80，90．若他们的平均分是 70 分，那么剩下那个学生的分数是多少分?

(A) 40 (B) 50 (C) 55 (D) 60 (E) 70

Problem 4

When Cheenu was a boy, he could run 15 miles in 3 hours and 30 minutes. As an old man, he can now walk 10 miles in 4 hours. How many minutes longer does it take for him to travel a mile now compared to when he was a boy?

当 Cheenu 还是个孩子时，他 3 小时 30 分钟内可以跑 15 英里，现在他是个老人，4 小时内可以走 10 英里。现在的他和当他还是个孩子时比起来，行过 1 英里需要多花多少分钟?

(A) 6 **(B)** 10 **(C)** 15 **(D)** 18 **(E)** 30

Problem 5

The number N is a two-digit number.

- When N is divided by 9, the remainder is 1.
- When N is divided by 10, the remainder is 3.

What is the remainder when N is divided by 11?

N 是个两位数。

- 当 N 除以 9，余数为 1.
- 当 N 除以 10，余数为 3.

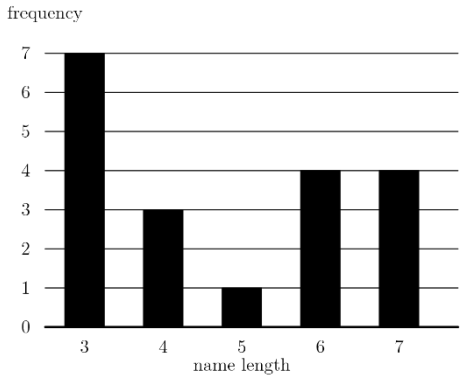
当 N 除以 11 时，余数是多少?

(A) 0 **(B)** 2 **(C)** 4 **(D)** 5 **(E)** 7

Problem 6

The following bar graph represents the length (in letters) of the names of 19 people. What is the median length of these names?

下面的柱状图代表了 19 个人的名字的长度（字母个数)。那么这些名字长度的中位数是多少?



Frequency丨频率　Name length丨名字长度

(A) 3　(B) 4　(C) 5　(D) 6　(E) 7

Problem 7

Which of the following numbers is not a perfect square?

下面哪个数不是完全平方数?

(A) 1^{2016}　(B) 2^{2017}　(C) 3^{2018}　(D) 4^{2019}　(E) 5^{2020}

Problem 8

Find the value of the expression:

计算下面表达式的值

$$100-98+96-94+92-90+\cdots+8-6+4-2$$

(A) 20　(B) 40　(C) 50　(D) 80　(E) 100

Problem 9

What is the sum of the distinct prime integer divisors of 2016?

2016 的不同质因数之和是多少?

(A) 9　(B) 12　(C) 16　(D) 49　(E) 63

Problem 10

Suppose that $a * b$ means $3a - b$. What is the value of x if $2 * (5 * x) = 1$

假设$a * b$表示$3a - b$. 那么，若$2 * (5 * x) = 1$，则x的值是多少?

(A) $\frac{1}{10}$ (B) 2 (C) $\frac{10}{3}$ (D) 10 (E) 14

Problem 11

Determine how many two-digit numbers satisfy the following property: when the number is added to the number obtained by reversing its digits, the sum is 132.

有多少个两位数满足下面的性质：当把这个两位数的十位数字和个位数字调换位置所形成的新的数与原来的数相加，所得的和是 132.

(A) 5 (B) 7 (C) 9 (D) 11 (E) 12

Problem 12

Jefferson Middle School has the same number of boys and girls. $\frac{3}{4}$ of the girls and $\frac{2}{3}$ of the boys went on a field trip. What fraction of the students on the field trip were girls?

Jefferson 中学的男生和女生数目相同。$\frac{3}{4}$ 的女生和 $\frac{2}{3}$ 的男生去郊游。那么这些去郊游的学生中，有多少比例是女生?

(A) $\frac{1}{2}$ (B) $\frac{9}{17}$ (C) $\frac{7}{13}$ (D) $\frac{2}{3}$ (E) $\frac{14}{15}$

Problem 13

Two different numbers are randomly selected from the set $\{-2, -1, 0, 3, 4, 5\}$ and multiplied together. What is the probability that the product is 0?

从集合 $\{-2, -1, 0, 3, 4, 5\}$ 中随机选择两个不同的数，并将它们相乘，那么乘积为 0 的概率是多少?

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

Problem 14

Karl's car uses a gallon of gas every 35 miles, and his gas tank holds 14 gallons when it is full. One day, Karl started with a full tank of gas, drove 350 miles, bought 8 gallons of gas, and continued driving to his destination. When he arrived, his gas tank was half full. How many miles did Karl drive that day?

Karl 的汽车每开 35 英里就需要 1 加仑汽油，且当他的油缸加满时，可以装 14 加仑的汽油。一天，Karl 开始他的行程前，把油缸加满了汽油，接着开了 350 英里，之后买了 8 加仑汽油，然后继续开到目的地。当他到达目的地时，他的油缸只剩下一半汽油。问 Karl 那天总共开了多少英里?

(A) 525 (B) 560 (C) 595 (D) 665 (E) 735

Problem 15

What is the largest power of 2 that is a divisor of $13^4 - 11^4$?

是$13^4 - 11^4$的一个因子的最大的 2 的幂是多少?

(A) 8 (B) 16 (C) 32 (D) 64 (E) 128

Problem 16

Annie and Bonnie are running laps around a 400-meter oval track. They started at the same time, at the same place, but Annie has pulled ahead because she runs 25% faster than Bonnie. How many laps will Annie have run when she first passes Bonnie?

Annie 和 Bonnie 绕着 400 米椭圆跑道跑步。他们同时起跑，但是因为 Annie 的速度比 Bonnie 快了 25%，所以她跑到了 Bonnie 的前面。当 Annie 第一次经过 Bonnie 时，Annie 已经跑了多少圈了?

(A) $1\frac{1}{4}$ (B) $3\frac{1}{3}$ (C) 4 (D) 5 (E) 25

Problem 17

An ATM password at Fred's Bank is composed of four digits from 0 to 9, with repeated digits allowable. If no password may begin with the sequence 9, 1,

1. then how many passwords are possible?

Fred 银行的取款机密码由 0 到 9 中的 4 个数字组成，且允许重复，如果密码不允许以序列 9，1，1 开头，那么一共有多少种可能的密码?

(A) 30 (B) 7290 (C) 9000 (D) 9990 (E) 9999

Problem 18

In an All-Area track meet, 216 sprinters enter a 100-meter dash competition. The track has 6 lanes, so only 6 sprinters can compete at a time. At the end of each race, the five non-winners are eliminated, and the winner will compete again in a later race. How many races are needed to determine the champion sprinter?

在一次全区田径比赛中，共有 216 个短跑运动员角逐 100 米冲刺赛。比赛一共有 6 个赛道，因此一次只允许 6 个短跑运动员同时比赛。每场比赛结束后，会淘汰掉其中 5 人，胜者将参与到下一次比赛中。问一共需要多少场比赛才能确定整个比赛最终的冠军?

(A) 36 (B) 42 (C) 43 (D) 60 (E) 72

Problem 19

The sum of 25 consecutive even integers is 10,000. What is the largest of these 25 consecutive integers?

25 个连续的偶数之和是 10,000，问这 25 个连续的整数中，最大的数是多少?

(A) 360 (B) 388 (C) 412 (D) 416 (E) 424

Problem 20

The least common multiple of a and b is 12, and the least common multiple of b and c is 15. What is the least possible value of the least common multiple of a and c?

a 和 b 的最小公倍数是 12, b 和 c 的最小公倍数是 15, 问 a 和 c 的最小公倍数的最小可能值是多少?

(A) 20 (B) 30 (C) 60 (D) 120 (E) 180

Problem 21

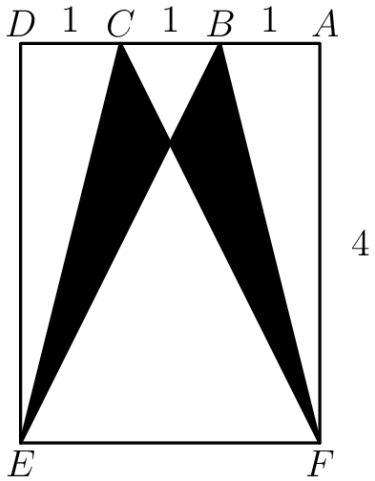
A top hat contains 3 red chips and 2 green chips. Chips are drawn randomly, one at a time without replacement, until all 3 of the reds are drawn or until both green chips are drawn. What is the probability that the 3 reds are drawn?

一个罐子里装有 3 个红色筹码和 2 个绿色筹码。现在将筹码一个个随机抽出且不放回，直到 3 个红色筹码被全部取出或者 2 个绿色筹码被全部取出，这时取出动作立即停止，那么取出 3 个红色筹码的概率是多少？

(A) $\frac{3}{10}$ (B) $\frac{2}{5}$ (C) $\frac{1}{2}$ (D) $\frac{3}{5}$ (E) $\frac{7}{10}$

Problem 22

Rectangle $DEFA$ below is a 3×4 rectangle with $DC = CB = BA = 1$. What is the area of the "bat wings" (shaded region)?



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

Problem 23

Two congruent circles centered at points A and B each pass through the other circle's center. The line containing both A and B is extended to intersect the circles at points C and D. The circles intersect at two points, one of which is E. What is the degree measure of $\angle CED$?

两个圆心分别在点 A 和点 B 的全等圆各自通过对方的圆心。连接点 A 和点 B 的直线和这 2 个圆交于点 C 和点 D。这 2 个圆交于 2 个点，其中之一是点 E. 那么 $\angle CED$ 的度数是多少?

(A) 90 (B) 105 (C) 120 (D) 135 (E) 150

Problem 24

The digits 1, 2, 3, 4, and 5 are each used once to write a five-digit number $PQRST$. The three-digit number PQR is divisible by 4, the three-digit number QRS is divisible by 5, and the three-digit number RST is divisible by 3. What is P?

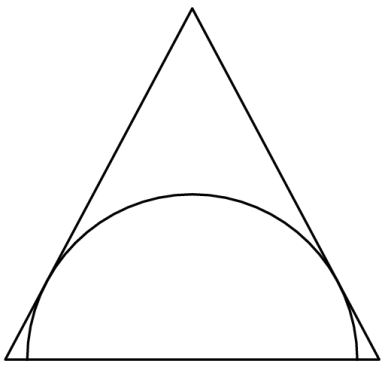
数字 1，2，3，4，5 各使用一次组成一个五位数 PQRST，其中三位数 PQR 能被 4 整除，三位数 QRS 能被 5 整除，三位数 RST 能被 3 整除。问 P 是多少?

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

Problem 25

A semicircle is inscribed in an isosceles triangle with base 16 and height 15 so that the diameter of the semicircle is contained in the base of the triangle as shown. What is the radius of the semicircle?

如图所示，一个底边为 16，高为 15 的等腰三角形内有一个半圆与两条腰相切，并且半圆的直径与三角形的底边重合，问这个半圆的半径是多少?



(A) $4\sqrt{3}$ (B) $\frac{120}{17}$ (C) 10 (D) $\frac{17\sqrt{2}}{2}$ (E) $\frac{17\sqrt{3}}{2}$

2016 AMC 8 Answer Key													
题目	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
答案	C	A	A	B	E	B	B	C	B	D	B	B	D
题目	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
答案	A	C	D	D	C	E	A	B	C	C	A	B	

2016 AMC8 Solution

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