# 2014 MAA AMC8

**Problem 1**

Harry and Terry are each told to calculate $8-(2+5)$. Harry gets the correct answer. Terry ignores the parentheses and calculates $8-2+5$. If Harry's answer is $H$ and Terry's answer is $T$, what is $H-T$?

Harry 和 Terry 都要求去计算 $8-(2+5)$，Harry 得到了正确答案，Terry 忽略了括号，计算成了 $8-2+5$，假设 Harry 的答案是 $H$，Terry 的答案是 $T$，则 $H-T$是多少?

(A) -10 (B) -6 (C) 0 (D) 6 (E) 10

**Problem 2**

Paul owes Paula 35 cents and has a pocket full of 5-cent coins, 10-cent coins, and 25-cent coins that he can use to pay her. What is the difference between the largest and the smallest number of coins he can use to pay her?

Paul 欠了 Paula 35 美分。Paula 目前口袋里有一堆 5 美分，10 美分和 25 美分的硬币可以用来还钱，他可用于还钱的最多硬币数目和最少硬币数目的差是多少?

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

**Problem 3**

Isabella had a week to read a book for a school assignment. She read an average of 36 pages per day for the first three days and an average of 44 pages per day for the next three days. She then finished the book by reading 10 pages on the last day. How many pages were in the book?

Isabella 的学校作业是花一周的时间读一本书。她前三天每天平均读 36 页，后三天平均每天读 44 页，之后在最后一天读了 10 页把整本书读完了。问这本书总共有多少页?

(A) 240 (B) 250 (C) 260 (D) 270 (E) 280

**Problem 4**

The sum of two prime numbers is 85. What is the product of these two prime numbers?

两个质数之和为 85，问这两个质数的乘积是多少?

(A) 85 (B) 91 (C) 115 (D) 133 (E) 166

**Problem 5**

Margie's car can go 32 miles on a gallon of gas, and gas currently costs $4 per gallon. How many miles can Margie drive on $20?

Margie 的汽车 1 加仑的汽油可以开 32 英里，汽油的当前价格是每加仑 4 美元。那么 20 美元可以让 Margie 的汽车开多少英里?

(A) 64 (B) 128 (C) 160 (D) 320 (E) 640

**Problem 6**

Six rectangles each with a common base width of 2 have lengths of 1, 4, 9, 16, 25, and 36. What is the sum of the areas of the six rectangles?

6 个矩形共同的宽是 2，它们的长分别是 1，4，9，16，25 和 36．那么这 6 个矩形的面积之和是多少?

(A) 91 (B) 93 (C) 162 (D) 182 (E) 202

**Problem 7**

There are four more girls than boys in Ms. Raub's class of 28 students. What is the ratio of number of girls to the number of boys in her class?

Raub 女士的课上总共有 28 个学生，而女生比男生多 4 个。那么她班上女生和男生的个数之比是多少?

(A) 3 : 4 (B) 4 : 3 (C) 3 : 2 (D) 7 : 4 (E) 2 : 1

**Problem 8**

Eleven members of the Middle School Math Club each paid the same integer amount for a guest speaker to talk about problem solving at their math club meeting. In all, they paid their guest speaker \$1*A*2. What is the missing digit A of this 3-digit number?

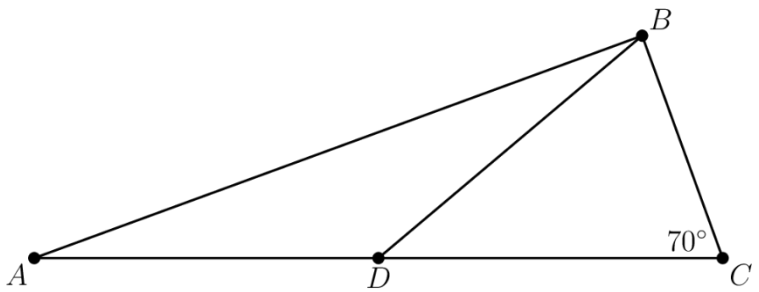
中学数学俱乐部的 11 个成员为了邀请一个客座演讲人在他们的数学俱乐部会议上讲授解题技巧，每个人都支付了同样的美元金额数且这个数是个整数。他们总共支付给客座演讲人\$1*A*2，这个三位数中的 A 代表什么数字?

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

**Problem 9**

In $\triangle ABC$, $D$ is a point on side $\overline{AC}$ such that $BD = DC$ and $\angle BCD$ measures $70^\circ$. What is the degree measure of $\angle ADB$?

在 $\triangle ABC$ 中，$D$ 是边 $\overline{AC}$ 上的一个点，满足 $BD = DC$，且 $\angle BCD = 70^\circ$．则 $\angle ADB$是多少度?




**(A)** 100 **(B)** 120 **(C)** 135 **(D)** 140 **(E)** 150

**Problem 10**

The first AMC8 was given in 1985 and it has been given annually since that time. Samantha turned 12 years old the year that she took the seventh AMC8. In what year was Samantha born?

第一次 AMC8 考试在 1985 年举行，那年之后的每一年都举办一次。Samantha 参加第 7 次 AMC8 考试的那一年，她 12 岁，那么 Samantha 是哪年出生的?

**(A)** 1979 **(B)** 1980 **(C)** 1981 **(D)** 1982 **(E)** 1983

**Problem 11**

Jack wants to bike from his house to Jill's house, which is located three blocks east and two blocks north of Jack's house. After biking each block, Jack can continue either east or north, but he needs to avoid a dangerous intersection one block east and one block north of his house. In how many ways can he reach Jill's house by biking a total of five blocks?

Jack 想从他家骑车到 Jill 家去，Jill 家位于 Jack 家向东 3 个街区，向北 2 个街区的位置。当 Jack 骑车经过每个街区后，他可以选择继续向东或者向北，但他必须绕开离他家向东 1 个街区，向北 1 个街区的一个危险的十字路口。那么他经过 5 个街区骑车到 Jill 的家一共有多少种路线?

(A) 4 (B) 5 (C) 6 (D) 8 (E) 10

**Problem 12**

A magazine printed photos of three celebrities along with three photos of the celebrities as babies. The baby pictures did not identify the celebrities. Readers were asked to match each celebrity with the correct baby pictures. What is the probability that a reader guessing at random will match all three correctly as a fraction?

一家杂志社打印了 3 位名人的照片，以及这 3 位名人婴儿时的照片。从婴儿照片上无法识别出对应的名人。杂志社要求读者把每位名人的照片和对应的婴儿照片正确匹配。某个读者随机匹配了这些照片，那么他把这 3 个名人都正确匹配的概率是多少?

(A) $\frac{1}{9}$ (B) $\frac{1}{6}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

**Problem 13**

If $n$ and $m$ are integers and $n^2+m^2$ is even, which of the following is impossible?

若 $n$ 和 $m$ 均为整数，且 $n^2+m^2$ 是偶数，那么下面哪个选项是不可能的?

(A) $n$ and $m$ are even | $n$ 和 $m$ 都是偶数

(B) $n$ and $m$ are odd | $n$ 和 $m$ 都是奇数

(C) $n+m$ is even | $n+m$ 是偶数

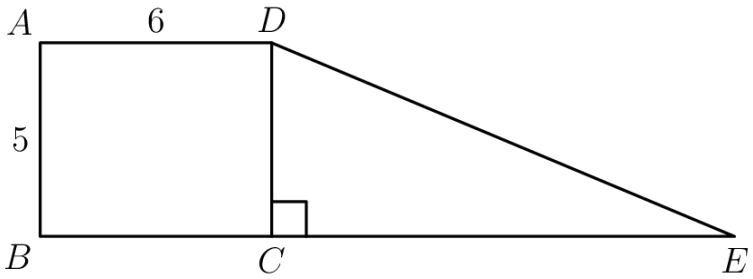
(D) $n+m$ is odd | $n+m$ 是奇数

(E) none of these are impossible | 所列的这些没有哪个不可能

**Problem 14**

Rectangle $ABCD$ and right triangle $DCE$ have the same area. They are joined to form a trapezoid, as shown. What is $DE$?

矩形 $ABCD$ 和直角三角形 $DCE$ 的面积相同。他们拼起来形成了一个梯形，如下图所示。那么 $DE$ 的长度是多少?

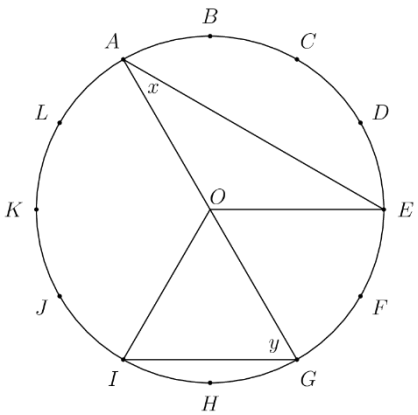



(A) 12 (B) 13 (C) 14 (D) 15 (E) 16

**Problem 15**

The circumference of the circle with center $O$ is divided into 12 equal arcs, marked the letters $A$ through $L$ as seen below. What is the number of degrees in the sum of the angles $x$ and $y$?

如下图所示，圆心为 $O$ 的圆被分成 12 个相等的圆弧，由字母 $A$ 到 $L$ 标识。那么角 $x$ 和角 $y$ 的度数之和是多少?



(A) 75 (B) 80 (C) 90 (D) 120 (E) 150

**Problem 16**

The "Middle School Eight" basketball conference has 8 teams. Every season, each team plays every other conference team twice (home and away), and each team also plays 4 games against non-conference opponents. What is the total number of games in a season involving the "Middle School Eight" teams?

“中学八队”篮球联盟共有 8 支球队。每一个赛季，篮球联盟内的每支球队都会与联盟内的其他球队进行两场比赛（主客场），联盟内的每支球队也会与非联盟对手进行 4 场比赛。“中学八队”球队在一个赛季中的比赛总数是多少？

(A) 60 (B) 88 (C) 96 (D) 144 (E) 160

**Problem 17**

George walks 1 mile to school. He leaves home at the same time each day, walks at a steady speed of 3 miles per hour, and arrives just as school begins. Today he was distracted by the pleasant weather and walked the first $\frac{1}{2}$ mile at a speed of only 2 miles per hour. At how many miles per hour must George run the last $\frac{1}{2}$ mile in order to arrive just as school begins today?

George 每天同一时间以恒定的 3 英里每小时的速度从家步行 1 英里去学校，且恰好准时到校。今天他被好天气吸引，因此前 $\frac{1}{2}$ 英里路程的速度仅为 2 英里每小时。那么后面 $\frac{1}{2}$ 英里的路程他应该以多少英里每小时的速度奔跑才能准时到校？

(A) 4 (B) 6 (C) 8 (D) 10 (E) 12

**Problem 18**

Four children were born at City Hospital yesterday. Assume each child is equally likely to be a boy or a girl. Which of the following outcomes is most likely?

昨天城市医院出生了 4 个婴儿，假设每个婴儿是男孩还是女孩的概率是相等的。

那么下面哪种结果是最有可能的?

**(A)** All 4 are boys | 4 个都是男孩

**(B)** All 4 are girls | 4 个都是女孩

**(C)** 2 are girls and 2 are boys | 2 个是男孩，2 个是女孩

**(D)** 3 are of one gender and 1 is of the other gender | 3 个是同一性别，另外 1 个是不同性别

**(E)** All of these outcomes are equally likely | 上述这些结果都是等可能的

**Problem 19**

A cube with 3-inch edges is to be constructed from 27 smaller cubes with 1-inch edges. Twenty-one of the cubes are colored red and 6 are colored white. If the 3-inch cube is constructed to have the smallest possible white surface area showing, what fraction of the surface area is white?

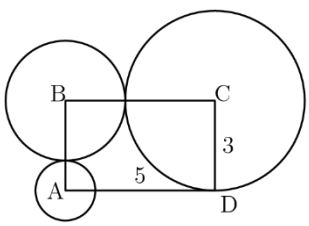
一个边长为 3 英寸的大正方体是由 27 个边长为 1 英寸的小正方体组成的。其中 21 个小正方体是红色的，6 个是白色的。若要求大的正方体的表面积中白色部分越少越好，那么表面积的白色部分所占总表面积的比例是多少?

**(A)** $\frac{5}{54}$ **(B)** $\frac{1}{9}$ **(C)** $\frac{5}{27}$ **(D)** $\frac{2}{9}$ **(E)** $\frac{1}{3}$

**Problem 20**

Rectangle $ABCD$ has sides $CD = 3$ and $DA = 5$. A circle with a radius of 1 is centered at $A$, a circle with a radius of 2 is centered at $B$, and a circle with a radius of 3 is centered at $C$. Which of the following is closest to the area of the region inside the rectangle but outside all three circles?

长方形 $ABCD$ 的边长 $CD = 3$，$DA = 5$．圆$A$的半径为 1，圆$B$的半径为 2，圆$C$的半径为 3．那么在长方形内部但在三个圆外部的区域的面积最接近下面哪个数?



(A) 3.4 (B) 4.0 (C) 4.5 (D) 5.0 (E) 5.5

**Problem 21**

The 7-digit numbers $\underline{74A52B1}$ and $\underline{326AB4C}$ are each multiples of 3. Which of the following could be the value of $C$?

七位数 $\underline{74A52B1}$ 和 $\underline{326AB4C}$ 都是 3 的倍数，那么下面哪个可能是 C 的值?

(A) 1 (B) 2 (C) 3 (D) 5 (E) 8

**Problem 22**

A 2-digit number is such that the product of the digits plus the sum of the digits is equal to the number. What is the units digit of the number?

一个两位数满足：各个位上数字之积加上各个位上数字之和，所得结果等于原来的两位数。那么原来两位数的个位数字是多少?

(A) 1 (B) 3 (C) 5 (D) 7 (E) 9

**Problem 23**

Three members of the Euclid Middle School girls' softball team had the following conversation.

Ashley: I just realized that our uniform numbers are all 2-digit primes.

Bethany: And the sum of your two uniform numbers is the date of my birthday earlier this month.

Caitlin: That's funny. The sum of your two uniform numbers is the date of my birthday later this month.

Ashley: And the sum of your two uniform numbers is today's date.

What number does Caitlin wear?

Euclid 中学女子垒球队的 3 名成员有如下对话：

Ashley：我刚意识到原来我们的球衣编号都是 2 位质数。

Bethany：并且你们两个人的球衣编号之和是这个月的早些时候我生日的日期。

Caitlin：真有趣。你们俩的球衣编号之和是这个月晚些时候我生日的日期。

Ashley：并且你们俩的球衣编号之和就是今天的日期。

那么 Caitlin 的球衣编号是多少？

(A) 11　(B) 13　(C) 17　(D) 19　(E) 23

**Problem 24**

One day the Beverage Barn sold 252 cans of soda to 100 customers, and every customer bought at least one can of soda. What is the maximum possible median number of cans of soda bought per customer on that day?

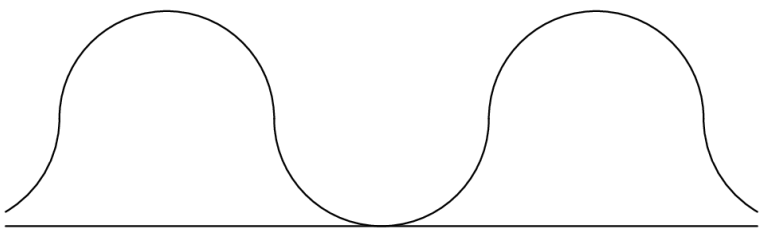
一天 Beverage Barn 向 100 个顾客卖出了 252 罐苏打水，且每个顾客买了至少一罐苏打水。那么那天每个顾客所买苏打水的罐数的中位数最大可能是多少？

(A) 2.5　(B) 3.0　(C) 3.5　(D) 4.0　(E) 4.5

**Problem 25**

A straight one-mile stretch of highway, 40 feet wide, is closed. Robert rides his bike on a path composed of semicircles as shown. If he rides at 5 miles per hour, how many hours will it take to cover the one-mile stretch?

一段长为 1 英里，宽 40 英尺的高速公路被关闭了。Robert 沿着如下图中由一系列半圆组成的路径骑着自行车。若他骑车的速度是 5 英里每小时，那么走过这段 1 英里的高速公路需要多少小时？



Note: 1 mile = 5280 feet | 注意：1 英里＝5280 英尺

(A) $\frac{\pi}{11}$　(B) $\frac{\pi}{10}$　(C) $\frac{\pi}{5}$　(D) $\frac{2\pi}{5}$　(E) $\frac{2\pi}{3}$

| 2014 AMC 8 Answer Key | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **题目** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** |
| **答案** | A | E | B | E | C | D | B | D | D | A | A | B | D |
| **题目** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | |
| **答案** | B | C | B | B | D | A | B | A | E | A | C | B | |

2014 AMC8 Solution

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