2019 MAA AMC8

Problem 1

Ike and Mike go into a sandwich shop with a total of $30.00 to spend. Sandwiches cost $4.50 each and soft drinks cost $1.00 each. Ike and Mike plan to buy as many sandwiches as they can, and use any remaining money to buy soft drinks. Counting both sandwiches and soft drinks, how many items will they buy?

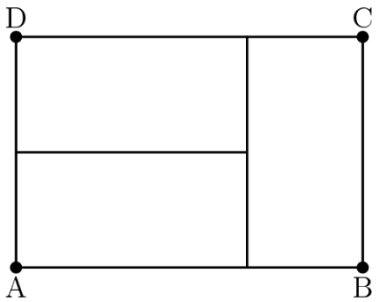
Ike 和 Mike 带着总共 30 美元去一家三明治商店，每块三明治价格 4.5 美元，每瓶软饮价格 1 美元。Ike 和 Mike 打算尽可能多的买三明治，然后用剩下的钱去买软饮料，那么三明治和软饮总个数加起来，他们将买多少件物品？

(A) 6 **(B)** 7 **(C)** 8 **(D)** 9 **(E)** 10

Problem 2

Three identical rectangles are put together to form rectangle *ABCD*, as shown in the figure below. Given that the length of the shorter side of each of the rectangles is 5 feet, what is the area in square feet of rectangle *ABCD*?

如图，把三个全等矩形拼在一起形成矩形 ABCD，已知每个小的矩形的短边为 5 英尺，求矩形 ABCD 的面积是多少平方英尺？



(A) 45 **(B)** 75 **(C)** 100 **(D)** 125 **(E)** 150

Problem 3

Which of the following is the correct order of the fractions $\frac{15}{11}$, $\frac{19}{15}$, and $\frac{17}{13}$, from least to greatest?

以下哪个是分数$\frac{15}{11}$，$\frac{19}{15}$，$\frac{17}{13}$从小到大的正确排序?

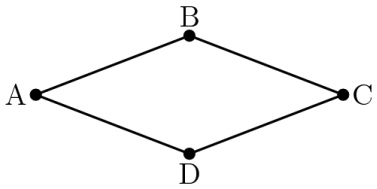
(A) $\frac{15}{11}<\frac{17}{13}<\frac{19}{15}$　(B) $\frac{15}{11}<\frac{19}{15}<\frac{17}{13}$　(C) $\frac{17}{13}<\frac{19}{15}<\frac{15}{11}$

(D) $\frac{19}{15}<\frac{15}{11}<\frac{17}{13}$　(E) $\frac{19}{15}<\frac{17}{13}<\frac{15}{11}$

Problem 4

Quadrilateral *ABCD* is a rhombus with perimeter 52 meters. The length of diagonal $\overline{AC}$ is 24 meters. What is the area in square meters of rhombus *ABCD*?

四边形 ABCD 是个周长为 52 米的菱形。对角线 $\overline{AC}$ 的长度为 24 米。那么菱形 ABCD 的面积是多少平方米?

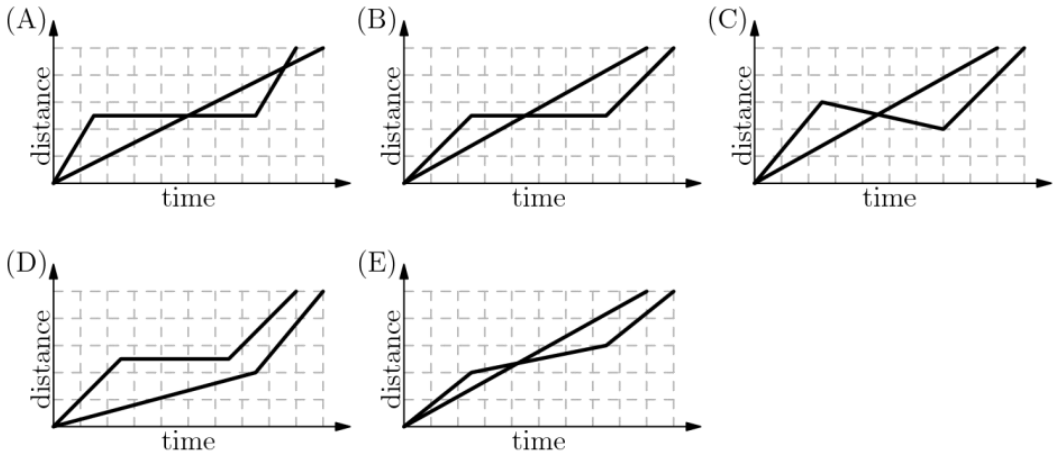


(A) 60　(B) 90　(C) 105　(D) 120　(E) 144

Problem 5

A tortoise challenges a hare to a race. The hare eagerly agrees and quickly runs ahead, leaving the slow-moving tortoise behind, believing that he will win, the hare stops to take a nap. Meanwhile, the tortoise walks at a slow, steady pace for the entire race. The hare wakes up and runs to the finish line, only to find the tortoise already there. Which of the following graphs matches the description of the race, showing the distance d traveled by the two animals over time t from start to finish?

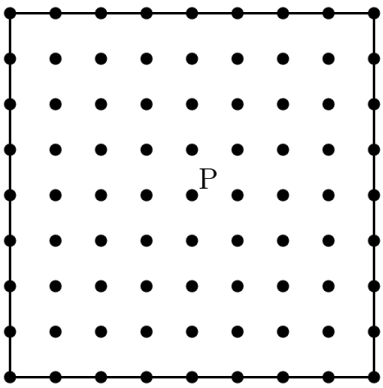
乌龟向野兔发起挑战赛跑，野兔开心的同意了，然后迅速跑到了前面，把行动迟缓的乌龟甩在了后面，野兔很自信自己会赢，于是停下来打了个盹，同时，乌龟以缓慢但恒定的速度走完了全程。野兔醒了，当它跑到终点时，发现乌龟已经在那里了。下面哪张图和上述对比赛的描述相匹配，并正确的展示了这 2 只动物走过的距离d与从开始到结束这段时间t的关系?



Problem 6

There are 81 grid points (uniformly spaced) in the square shown in the diagram below, including the points on the edges. Point P is in the center of the square. Given that point Q is randomly chosen among the other 80 points, what is the probability that the line PQ is a line of symmetry for the square?

在下图所示的正方形中，一共有 81 个格点（均匀分布），包括边上的点。点P位于正方形的中心。已知点Q是从其他 80 个点中随机选择的一个点，问直线PQ是正方形的一条对称轴的概率是多少？



(A) $\frac{1}{5}$ (B) $\frac{1}{4}$ (C) $\frac{2}{5}$ (D) $\frac{9}{20}$ (E) $\frac{1}{2}$

Problem 7

Shauna takes five tests, each worth a maximum of 100 points. Her scores on the first three tests are 76, 94, and 87. In order to average 81 for all five tests, what is the lowest score she could earn on one of the other two tests?

Shauna 一共考了 5 场考试，每场的满分都是 100 分。前三场考试的得分是 76，94 和 87，为了使得所有 5 场考试的平均分是 81 分，那么剩下 2 场考试中其中 1 场考试的最低得分可以是多少分?

(A) 48 (B) 52 (C) 66 (D) 70 (E) 74

Problem 8

Gilda has a bag of marbles. She gives 20% of them to her friend Pedro. Then Gilda gives 10% of what is left to another friend, Ebony. Finally, Gilda gives 25% of what is now left in the bag to her brother Jimmy. What percentage of her original bag of marbles does Gilda have left for herself?

Gilda 有一包玻璃球，她把其中 20%给了她的朋友 Pedro，接着她把剩下的 10%给了另一个朋友 Ebony，最后 Gilda 把包里当前剩下的 25%给了她弟弟 Jimmy。问 Gilda 给她自己留了原来玻璃球总数的百分之多少?

(A) 20 (B) $33\frac{1}{3}$ (C) 38 (D) 45 (E) 54

Problem 9

Alex and Felicia each have cats as pets. Alex buys cat food in cylindrical cans that are 6 cm in diameter and 12 cm high. Felicia buys cat food in cylindrical cans that are 12 cm in diameter and 6 cm high. What is the ratio of the volume of one of Alex's cans to the volume one of Felicia's cans?

Alex 和 Felicia 他们都有宠物猫。Alex 买的宠物猫粮是装在底面直径为 6 厘米，高度 12 厘米的圆柱形罐子里的。Felicia 买的猫粮则装在底面直径是 12 厘米，高为 6 厘米的圆柱形罐子里。问 Alex 的罐子的体积和 Felicia 的罐子的体积之比是多少?

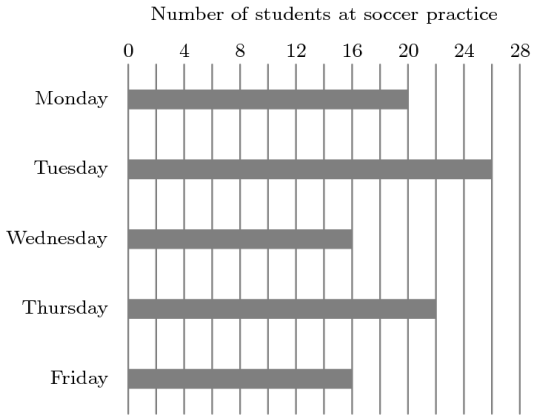
(A) 1 : 4 (B) 1 : 2 (C) 1 : 1 (D) 2 : 1 (E) 4 : 1

Problem 10

The diagram shows the number of students at soccer practice each weekday during last week. After computing the mean and median values, Coach discovers that there were actually 21 participants on Wednesday. Which of the

following statements describes the change in the mean and median after the correction is made?

下面这张图展示了上周的每个工作日某个足球训练场的学生数。在计算完平均值和中位数之后，教练发现周三实际有 21 个参加者。那么当纠正了这个错误后，下面对于平均数和中位数的改变的论断中，哪个是正确的?



(A) The mean increases by 1 and the median does not change. | 平均数增加 1，中位数不变。

(B) The mean increases by 1 and the median increases by 1. | 平均数增加 1，中位数增加 1。

(C) The mean increases by 1 and the median increases by 5. . | 平均数增加 1，中位数增加 5。

(D) The mean increases by 5 and the median increases by 1. | 平均数增加 5，中位数增加 1。

(E) The mean increases by 5 and the median increases by 5. | 平均数增加 5，中位数增加 5。

Problem 11

The third-grade class at Lincoln Elementary School has 93 students. Each student takes a math class or a foreign language class or both. There are 70 third graders taking a math class, and there are 54 third graders taking a foreign language class. How many third graders take *only* a math class and *not* a foreign language class?

林肯中学的八年级总共有 93 个学生。每个学生都会上一门数学课或者一门外语

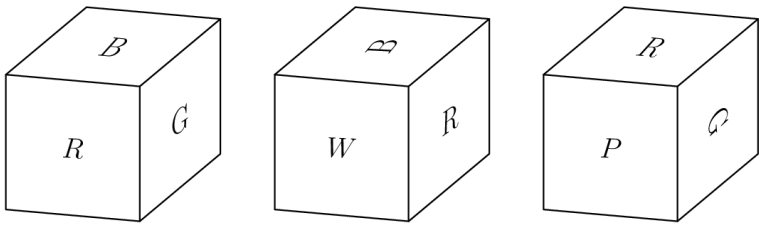
课或者两者都上。已知有 70 个八年级学生上一门数学课，54 个八年级学生上一门外语课。问有多少个八年级学生只上数学课而不上外语课?

(A) 16 **(B)** 23 **(C)** 31 **(D)** 39 **(E)** 70

Problem 12

The faces of a cube are painted in six different colors: red (*R*), white (*W*), green (*G*), brown (*B*), aqua (*A*), and purple (*P*). Three views of the cube are shown below. What is the color of the face opposite the aqua face?

用六种不同的颜色给一个正方体的六个面涂色：红色(R)，白色(W)，绿色(G)，棕色（B），湖绿色（A）和紫色（P)。下图展示了这个正方体的 3 个不同视图。那么和湖绿色面相对的那个面的颜色是什么颜色?



(A) red | 红色 **(B)** white | 白色 **(C)** green | 绿色

(D) brown | 棕色 **(E)** purple | 紫色

Problem 13

A *palindrome* is a number that has the same value when read from left to right or from right to left. (For example, 12321 is a palindrome.) Let N be the least three-digit integer which is not a palindrome but which is the sum of three distinct two-digit palindromes. What is the sum of the digits of N?

回环数是指从左向右读和从右向左读，读数是一样的数（例如，12321 是个回环数)。N是满足以下条件的最小三位整数：它不是个回环数，并且它是 3 个不同的两位回环数的和。问N的各个位上的数字之和是多少?

(A) 2 **(B)** 3 **(C)** 4 **(D)** 5 **(E)** 6

Problem 14

Isabella has 6 coupons that can be redeemed for free ice cream cones at Pete's Sweet Treats. In order to make the coupons last, she decides that she will redeem one every 10 days until she has used them all. She knows that Pete's is closed on Sundays, but as she circles the 6 dates on her calendar, she realizes that no circled date falls on a Sunday. On what day of the week does Isabella redeem her first coupon?

Isabella 有 6 张优惠券，可用于在 Pete 甜品店里免费兑换冰激凌。为了最后使用优惠券，她决定每 10 天兑换一次直到所有的优惠券都使用完毕。已知 Pete 甜品店周日是不营业的，当她在日历上圈出兑换冰激凌的这 6 天时，发现没有哪天是周日。问 Isabella 兑换她的第一个优惠券是在周几?

(A) Monday | 周一　(B) Tuesday | 周二　(C) Wednesday | 周三
(D) Thursday | 周四　(E) Friday | 周五

Problem 15

On a beach, 50 people are wearing sunglasses and 35 people are wearing caps. Some people are wearing both sunglasses and caps. If one of the people wearing a cap is selected at random, the probability that this person is also wearing sunglasses is $\frac{2}{5}$. If instead, someone wearing sunglasses is selected at random, what is the probability that this person is also wearing a cap?

在一个沙滩上，50 人戴着太阳镜，35 人戴着帽子，有些人同时戴着太阳镜和帽子。如果从戴着帽子的人当中随机选一人，那么这个人同时也戴着太阳镜的概率是 $\frac{2}{5}$。相反，如果从戴着太阳镜的人当中随机选择一人，那么这个人同时也戴着帽子的概率是多少?

(A) $\frac{14}{85}$　(B) $\frac{7}{25}$　(C) $\frac{2}{5}$　(D) $\frac{4}{7}$　(E) $\frac{7}{10}$

Problem 16

Qiang drives 15 miles at an average speed of 30 miles per hour. How many additional miles will he have to drive at 55 miles per hour to average 50 miles per hour for the entire trip?

Qiang 以 30 英里每小时的平均速度行驶了 15 英里。问他还需要以 55 英里每小时的速度行驶多少英里，这样可以使得全程的平均速度为 50 英里每小时?

(A) 45 (B) 62 (C) 90 (D) 110 (E) 135

Problem 17

What is the value of the product

下式的值是多少

$$\left(\frac{1\cdot 3}{2\cdot 2}\right)\left(\frac{2\cdot 4}{3\cdot 3}\right)\left(\frac{3\cdot 5}{4\cdot 4}\right)\cdots\left(\frac{97\cdot 99}{98\cdot 98}\right)\left(\frac{98\cdot 100}{99\cdot 99}\right)?$$

(A) $\frac{1}{2}$ (B) $\frac{50}{99}$ (C) $\frac{9800}{9801}$ (D) $\frac{100}{99}$ (E) 50

Problem 18

The faces of each of two fair dice are numbered 1, 2, 3, 5, 7, and 8. When the two dice are tossed, what is the probability that their sum will be an even number?

两个标准骰子的 6 个面都标有数字 1，2，3，5，7，8.当掷了这两个骰子，问它们的数字和是个偶数的概率是多少?

(A) $\frac{4}{9}$ (B) $\frac{1}{2}$ (C) $\frac{5}{9}$ (D) $\frac{3}{5}$ (E) $\frac{2}{3}$

Problem 19

In a tournament there are six teams that play each other twice. A team earns 3 points for a win, 1 point for a draw, and 0 points for a loss. After all the games have been played it turns out that the top three teams earned the same number of total points. What is the greatest possible number of total points for each of the top three teams?

在一场循环赛中，一共有 6 支队伍，每两支队伍之间都要比赛 2 次。某个队伍赢一次得 3 分，平局得 1 分，输了则得 0 分。当所有比赛都结束后，结果发现排名前三的队伍得分相同。问排名前三的队伍每支队最多可能得多少分?

(A) 22 (B) 23 (C) 24 (D) 26 (E) 30

Problem 20

How many different real numbers x satisfy the equation $(x^2-5)^2=16$?

有多少个不同的实数 x 满足方程 $(x^2-5)^2=16$?

(A) 0 (B) 1 (C) 2 (D) 4 (E) 8

Problem 21

What is the area of the triangle formed by the lines $y=5$, $y=1+x$, and $y=1-x$?

由三条直线 $y=5$，$y=1+x$ 和 $y=1-x$ 所包围的三角形的面积是多少?

(A) 4 (B) 8 (C) 10 (D) 12 (E) 16

Problem 22

A store increased the original price of a shirt by a certain percent and then decreased the new price by the same percent. Given that the resulting price was 84% of the original price, by what percent was the price increased and decreased?

一家商店把衬衫的原价提高了某个百分数，然后又把新价降低了同样的百分数。已知最终的价格是原价的 84%，问价格升高和降低了百分之多少?

(A) 16 (B) 20 (C) 28 (D) 36 (E) 40

Problem 23

After Euclid High School's last basketball game, it was determined that $\frac{1}{4}$ of the team's points were scored by Alexa and $\frac{2}{7}$ were scored by Brittany. Chelsea scored 15 points. None of the other 7 team members scored more than 2 points. What was the total number of points scored by the other 7 team members?

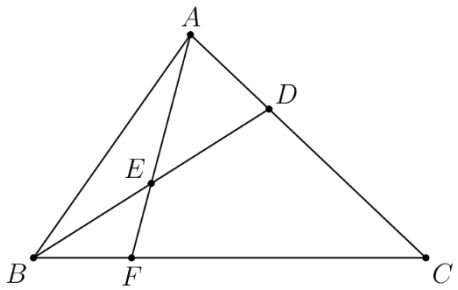
在 Euclid 高中最近的篮球赛后，发现队伍总分的 $\frac{1}{4}$ 是 Alexa 获得的，$\frac{2}{7}$ 是 Brittany 获得的，Chelsea 得了 15 分。队伍中的其他 7 个队员没有一个得分超过 2 分。问其他 7 个队员获得的总分是多少分?

(A) 10 (B) 11 (C) 12 (D) 13 (E) 14

Problem 24

In triangle ABC, point D divides side $\overline{AC}$ so that AD : DC=1 : 2 . Let E be the midpoint of $\overline{BD}$ and let F be the point of intersection of line BC and line AE. Given that the area of △ABC is 360, what is the area of △EBF?

在三角形 ABC 中，点 D 把边$\overline{AC}$分成的两段满足 AD:DC＝1:2，点 E 是线段$\overline{BD}$的中点，F 是直线 BC 和 AE 的交点。已知 ΔABC 的面积是 360，问 ΔEBF 的面积是多少?



(A) 24 **(B)** 30 **(C)** 32 **(D)** 36 **(E)** 40

Problem 25

Alice has 24 apples. In how many ways can she share them with Becky and Chris so that each of the three people has at least two apples?

Alice 有 24 个苹果。她有多少种和 Becky 与 Chris 分享苹果的方式，使得三人中的每个人都至少有 2 个苹果?

(A) 105 **(B)** 114 **(C)** 190 **(D)** 210 **(E)** 380

2019 AMC 8 Answer Key													
题目	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
答案	D	E	E	D	B	C	A	E	B	B	D	A	A
题目	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	
答案	C	B	D	B	C	C	D	E	E	B	B	C	

2019 AMC8 Solution



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