2013 AMC8

Problem 1

Danica wants to arrange her model cars in rows with exactly 6 cars in each row. She now has 23 model cars. What is the smallest number of additional cars she must buy in order to be able to arrange all her cars this way?

Danica 想把她的模型汽车排成每行 6 辆的若干行，她现在有 23 辆模型汽车，那么她还需要至少买多少辆模型汽车才能完成上述安排？

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

Problem 2

A sign at the fish market says, "50% off, today only: half-pound packages for just $3 per package." What is the regular price for a full pound of fish, in dollars? (Assume that there are no deals for bulk)

鱼市上的一则标语写着：“降价 50%，仅限今天：半磅重的一包鱼仅需 3 美元。”那么一磅重的鱼原价是多少美元？

$\textbf{(A)}\ 6 \qquad \textbf{(B)}\ 9 \qquad \textbf{(C)}\ 10 \qquad \textbf{(D)}\ 12 \qquad \textbf{(E)}\ 15$

Problem 3

What is the value of $4 \cdot (-1+2-3+4-5+6-7+\cdots+1000)$?

表达式$4 \cdot (-1+2-3+4-5+6-7+\cdots+1000)$的值是多少？

$\textbf{(A)}\ -10 \qquad \textbf{(B)}\ 0 \qquad \textbf{(C)}\ 1 \qquad \textbf{(D)}\ 500 \qquad \textbf{(E)}\ 2000$

Problem 4

Eight friends ate at a restaurant and agreed to share the bill equally. Because Judi forgot her money, each of her seven friends paid an extra $2.50 to cover her portion of the total bill. What was the total bill?

8 个朋友在餐馆吃饭，并且商定均摊费用。因为 Judi 忘记带钱了，她的其他 7 个朋友帮她垫付了费用，因此 7 个人每人额外多付了 2.5 美元。那么餐费总共是多少美元？

$\textbf{(A)}\ \$120 \qquad \textbf{(B)}\ \$128 \qquad \textbf{(C)}\ \$140 \qquad \textbf{(D)}\ \$144 \qquad \textbf{(E)}\ \$160$

Problem 5

Hammie is in the 6^{th} grade and weighs 106 pounds. Her quadruplet sisters are tiny babies and weigh 5, 5, 6, and 8 pounds. Which is greater, the average (mean) weight of these five children or the median weight, and by how many pounds?

Hammie 目前六年级，重 106 磅。她的四胞胎妹妹们现在还是婴儿，分别重 5，5，6，8 磅。问这 5 个小孩的平均重量和重量的中位数，哪个大？大多少磅？

（A）Median，by 60丨中位数，大 60

（B）Median，by 20丨中位数，大 20

（C）Average，by5丨平均值，大 5

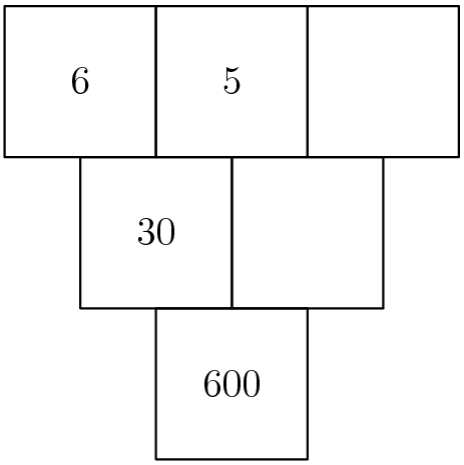
（D）Average，by 15丨平均值，大 15

（E）Average，by 20丨平均值，大 20

Problem 6

The number in each box below is the product of the numbers in the two boxes that touch it in the row above. For example, $30 = 6 \times 5$. What is the missing number in the top row?

下图中每个方格中的数字等于上一层和它相接触的两个方格内的数字之积。例如，30=6 x 5. 那么在顶层的方格中，空白方格里的数字是多少？



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

Problem 7

Trey and his mom stopped at a railroad crossing to let a train pass. As the train began to pass, Trey counted 6 cars in the first 10 seconds. It took the train 2 minutes and 45 seconds to clear the crossing at a constant speed. Which of the following was the most likely number of cars in the train?

Trey 和他妈妈为了让一辆火车通过，在铁路的交叉口停了下来。当火车开始通过时，在前 10 秒他们数到了 6 节车厢。火车以恒定的速度完全通过这个交叉口耗时 2 分钟 45 秒，那么这列火车最有可能有多少节车厢？

$\textbf{(A)}\ 60 \qquad \textbf{(B)}\ 80 \qquad \textbf{(C)}\ 100 \qquad \textbf{(D)}\ 120 \qquad \textbf{(E)}\ 140$

Problem 8

A fair coin is tossed 3 times. What is the probability of at least two consecutive heads?

一枚标准的硬币被掷了 3 次，至少有 2 次连续正面朝上的概率是多少？

$\textbf{(A)}\ \frac{1}{8} \qquad \textbf{(B)}\ \frac{1}{4} \qquad \textbf{(C)}\ \frac{3}{8} \qquad \textbf{(D)}\ \frac{1}{2} \qquad \textbf{(E)}\ \frac{3}{4}$

Problem 9

The Incredible Hulk can double the distance it jumps with each succeeding jump. If its first jump is 1 meter, the second jump is 2 meters, the third jump is 4 meters, and so on, then on which jump will it first be able to jump more than 1 kilometer?

绿巨人浩克每次跳的长度都是前面一次的两倍。若它第一次跳了 1 米，第二次跳了 2 米，第三次跳了 4 米，以此类推，那么第几次跳的长度超过 1 公里？

$\textbf{(A)}\ 9^{\text{th}} \qquad \textbf{(B)}\ 10^{\text{th}} \qquad \textbf{(C)}\ 11^{\text{th}} \qquad \textbf{(D)}\ 12^{\text{th}} \qquad \textbf{(E)}\ 13^{\text{th}}$

Problem 10

What is the ratio of the least common multiple of 180 and 594 to the greatest common factor of 180 and 594?

180 和 594 的最小公倍数和最大公约数的比值是多少？

$\textbf{(A)}\ 110 \qquad \textbf{(B)}\ 165 \qquad \textbf{(C)}\ 330 \qquad \textbf{(D)}\ 625 \qquad \textbf{(E)}\ 660$

Problem 11

Ted's grandfather used his treadmill on 3 days this week. He went 2 miles each day. On Monday he jogged at a speed of 5 miles per hour. He walked at the rate of 3 miles per hour on Wednesday and at 4 miles per hour on Friday. If Grandfather had always walked at 4 miles per hour, he would have spent less time on the treadmill. How many minutes less?

Ted 的爷爷这周有 3 天使用跑步机跑步。他每天跑 2 英里。周一他跑步的速度是 5 英里每小时，周三是 3 英里每小时，周五是 4 英里每小时。若他爷爷这 3 天跑步的速度都保持在 4 英里每小时的话，他在跑步机上花费的时间会更少一些，那么少多少分钟？

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

Problem 12

At the 2013 Winnebago County Fair a vendor is offering a "fair special" on sandals. If you buy one pair of sandals at the regular price of 50, you get a second pair at a 40% discount, and a third pair at half the regular price. Javier took advantage of the "fair special" to buy three pairs of sandals. What percentage of the 150 dollar regular price did he save?

在 2013 年温尼贝戈县博览会上，一位供应商提供了一款凉鞋的“展会特价”。如果以原价 50 元购买一双凉鞋，那么第二双价格降低 40%，第三双半价。Javier 利用“展会特价”买了三双凉鞋。那么对比原价 150 美元，他节省了百分之多少？

$\textbf{(A)}\ 25\% \qquad \textbf{(B)}\ 30\% \qquad \textbf{(C)}\ 33\% \qquad \textbf{(D)}\ 40\% \qquad \textbf{(E)}\ 45\%$

Problem 13

When Clara totaled her scores, she inadvertently reversed the units digit and the tens digit of one score. By which of the following might her incorrect sum have differed from the correct one?

当 Clara 把她的所有的考试分数相加时，她不小心把某个分数的十位数字和个位数字调换了。那么她不正确的总分和正确总分可能相差多少？

$\textbf{(A)}\ 45 \qquad \textbf{(B)}\ 46 \qquad \textbf{(C)}\ 47 \qquad \textbf{(D)}\ 48 \qquad \textbf{(E)}\ 49$

Problem 14

Abe holds 1 green and 1 red jelly bean in his hand. Bob holds 1 green, 1 yellow, and 2 red jelly beans in his hand. Each randomly picks a jelly bean to show the other. What is the probability that the colors match?

Abe 手里拿着一颗绿色的和一颗红色的果冻豆。Bob 手里拿着一颗绿色的、一颗黄色的和两颗红色的果冻豆。每个人随机挑选一个果冻豆给对方看。那么这两颗果冻豆颜色匹配的概率是多少？

$\textbf{(A)}\ \frac{1}{4} \qquad \textbf{(B)}\ \frac{1}{3} \qquad \textbf{(C)}\ \frac{3}{8} \qquad \textbf{(D)}\ \frac{1}{2} \qquad \textbf{(E)}\ \frac{2}{3}$

Problem 15

If $3^p + 3^4 = 90, 2^r + 44 = 76$, and $5^3 + 6^s = 1421$, what is the product of p, r, and s?

如果$3^p + 3^4 = 90$，$2^r + 44 = 76$，$5^3 + 6^s = 1421$，那么 P，r和 s 的乘积是多少？

$\textbf{(A)}\ 27 \qquad \textbf{(B)}\ 40 \qquad \textbf{(C)}\ 50 \qquad \textbf{(D)}\ 70 \qquad \textbf{(E)}\ 90$

Problem 16

A number of students from Fibonacci Middle School are taking part in a community service project. The ratio of 8^{th}-graders to 6^{th}-graders is $5:3$, and the ratio of 8^{th}-graders to 7^{th}-graders is $8:5$. What is the smallest number of students that could be participating in the project?

Fibonacci 中学的一些学生正在参加一项社区服务项目。其中，八年级和六年级学生的个数之比为 5：3，八年级学生和七年级学生的个数之比是 8：5．那么参加这个项目的学生数最少是多少个？

$\textbf{(A)}\ 16 \qquad \textbf{(B)}\ 40 \qquad \textbf{(C)}\ 55 \qquad \textbf{(D)}\ 79 \qquad \textbf{(E)}\ 89$

Problem 17

The sum of six consecutive positive integers is 2013. What is the largest of these six integers?

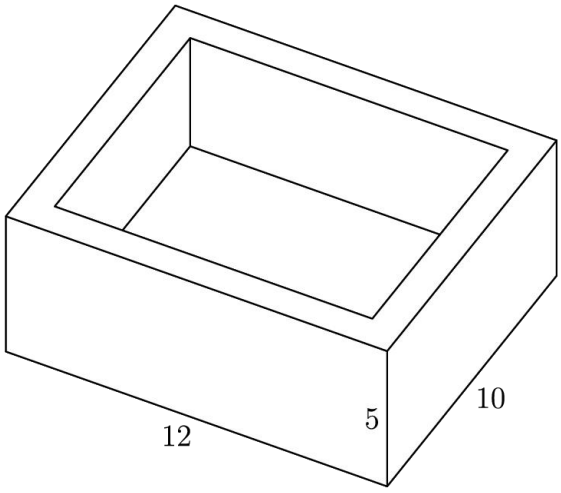
六个连续正整数之和是 2013，那么这六个整数中最大的整数是多少？

$\textbf{(A)}\ 335 \qquad \textbf{(B)}\ 338 \qquad \textbf{(C)}\ 340 \qquad \textbf{(D)}\ 345 \qquad \textbf{(E)}\ 350$

Problem 18

Isabella uses one-foot cubical blocks to build a rectangular fort that is 12 feet long, 10 feet wide, and 5 feet high. The floor and the four walls are all one foot thick. How many blocks does the fort contain?

Isabella 使用一些边长为 1 英尺的正方体砖块来建造一个长为 12 英尺，宽 10 英尺，高 5 英尺的堡垒。堡垒的地板和 4 堵墙的厚度都是 1 英尺。那么这个堡垒需要多少块砖块？



(A) 204 **(B)** 280 **(C)** 320 **(D)** 340 **(E)** 600

Problem 19

Bridget, Cassie, and Hannah are discussing the results of their last math test. Hannah shows Bridget and Cassie her test, but Bridget and Cassie don't show theirs to anyone. Cassie says, 'I didn't get the lowest score in our class,' and Bridget adds, 'I didn't get the highest score.' What is the ranking of the three girls from the highest score to the lowest score?

Bridget，Cassie 和 Hannah 正在讨论她们最近一次数学考试的成绩。Hannah 向 Bridget 和 Cassie 展示了她的分数，但是 Bridget 和 Cassie 没有把她们各自的分数告诉任何人。Cassie 说：“我的分数不是我们班最低的。”Bridget 补充道：“我没有得到最高的分数。”那么这 3 个女孩的分数从高到低排名是下面哪个？

(A) Hannah, Cassie, Bridget **(B)** Hannah, Bridget, Cassie
(C) Cassie, Bridget, Hannah **(D)** Cassie, Hannah, Bridget
(E) Bridget, Cassie, Hannah

Problem 20

A 1×2 rectangle is inscribed in a semicircle with longer side on the diameter. What is the area of the semicircle?

一个 1 x 2 的矩形内接在一个半圆内，矩形的长边和圆的直径重合。那么这个半圆的面积是多少？

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

Problem 21

Samantha lives 2 blocks west and 1 block south of the southwest corner of City Park. Her school is 2 blocks east and 2 blocks north of the northeast corner of City Park. On school days she bikes on streets to the southwest corner of City Park, then takes a diagonal path through the park to the northeast corner, and then bikes on streets to school. If her route is as short as possible, how many different routes can she take?

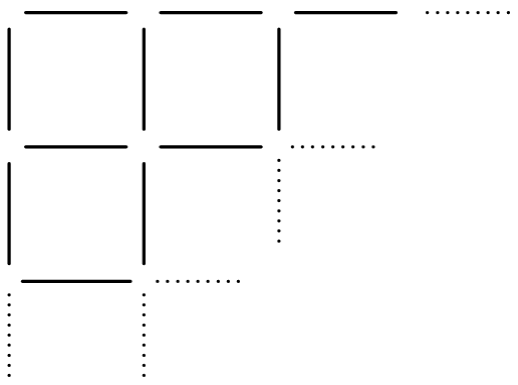
Samantha 住在城市公园的西南角向西 2 个街区和向南 1 个街区的位置，而她的学校在城市公园的东北角向东两个街区和向北两个街区的位置。上学时，她首先沿着街道骑自行车到城市公园的西南角，然后沿着公园的一条对角线穿过公园到东北角，然后再沿着街道骑自行车到学校。如果她的路线尽可能短，她可以走多少条不同的路线？

$\textbf{(A)}\ 3 \qquad \textbf{(B)}\ 6 \qquad \textbf{(C)}\ 9 \qquad \textbf{(D)}\ 12 \qquad \textbf{(E)}\ 18$

Problem 22

Toothpicks are used to make a grid that is 60 toothpicks long and 32 toothpicks wide. How many toothpicks are used altogether?

下图所示的网格是用牙签做成的，网格长为 60 根牙签，宽为 32 根牙签。则总共用了多少根牙签？

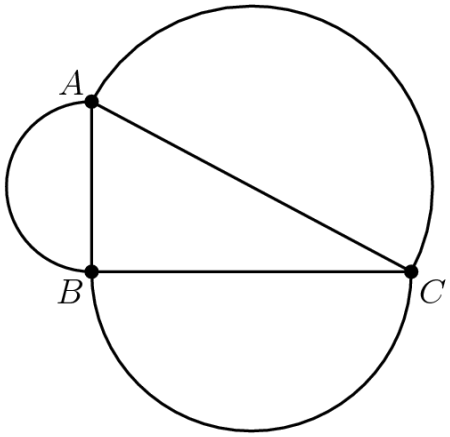


$\textbf{(A)}\ 1920 \qquad \textbf{(B)}\ 1952 \qquad \textbf{(C)}\ 1980 \qquad \textbf{(D)}\ 2013 \qquad \textbf{(E)}\ 3932$

Problem 23

Angle ABC of $\triangle ABC$ is a right angle. The sides of $\triangle ABC$ are the diameters of semicircles as shown. The area of the semicircle on $\overline{AB}$ equals 8π, and the arc of the semicircle on $\overline{AC}$ has length 8.5π. What is the radius of the semicircle on $\overline{BC}$?

在$\triangle ABC$内，$\angle ABC$ 是一个直角。$\triangle ABC$的三条边是如图所示的三个半圆的直径。$\overline{AB}$边上的半圆面积是 8π，$\overline{AC}$边上的半圆弧长为 8.5π．那么$\overline{BC}$边上的半圆的半径是多少？

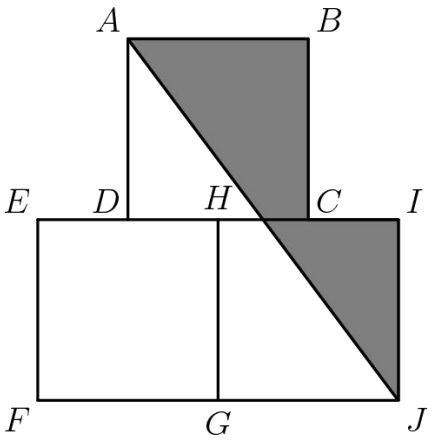


(A) 7 **(B)** 7.5 **(C)** 8 **(D)** 8.5 **(E)** 9

Problem 24

Squares $ABCD$, $EFGH$, and $GHIJ$ are equal in area. Points C and D are the midpoints of sides IH and HE, respectively. What is the ratio of the area of the shaded pentagon $AJICB$ to the sum of the areas of the three squares?

正方形 *ABCD*，*EFGH* 和 *GHIJ* 的面积都相等。点 *C* 和点 *D* 分别是边 *IH* 和 *HE* 的中点。那么阴影部分五边形 *AJICB* 的面积和三个正方形面积总和的比值是多少？

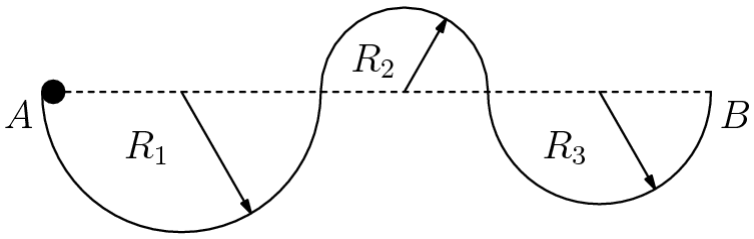


(A) $\frac{1}{4}$ **(B)** $\frac{7}{24}$ **(C)** $\frac{1}{3}$ **(D)** $\frac{3}{8}$ **(E)** $\frac{5}{12}$

Problem 25

A ball with diameter 4 inches starts at point A to roll along the track shown. The track is comprised of 3 semicircular arcs whose radii are $R_1 = 100$ inches, $R_2 = 60$ inches, and $R_3 = 80$ inches, respectively. The ball always remains in contact with the track and does not slip. What is the distance the center of the ball travels over the course from A to B?

直径为 4 英寸的球从 A 开始沿着图示轨道滚动。轨道由 3 段半圆弧组成，半径分别为 R1=100 英寸，R2=60 英寸，R3=80 英寸。球全程都和轨道紧密接触，并且不会滑动。那么当球从 *A* 滚到 *B*，球心所经过的路程是多少英寸？



(A) 238π **(B)** 240π **(C)** 260π **(D)** 280π **(E)** 500π

2013 AMC 8 Answer Key

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