2004 AMC8

Problem 1

On a map, a 12-centimeter length represents 72 kilometers. How many kilometers does a 17-centimeter length represent?

在一张地图上，12 厘米长代表 72 公里。则 17 厘米长代表多少公里？

$\textbf{(A)}\ 6 \qquad \textbf{(B)}\ 102 \qquad \textbf{(C)}\ 204 \qquad \textbf{(D)}\ 864 \qquad \textbf{(E)}\ 1224$

Problem 2

How many different four-digit numbers can be formed by rearranging the four digits in 2004?

将 2004 的四个数字重新排列可以形成多少个不同的四位数?

$\textbf{(A)}\ 4 \qquad \textbf{(B)}\ 6 \qquad \textbf{(C)}\ 16 \qquad \textbf{(D)}\ 24 \qquad \textbf{(E)}\ 81$

Problem 3

Twelve friends met for dinner at Oscar's Overstuffed Oyster House, and each ordered one meal. The portions were so large, there was enough food for 18 people. If they shared, how many meals should they have ordered to have just enough food for the 12 of them?

12 位朋友在奥斯卡的“牡蛎屋”共进晚餐，每人点了 1 份晚餐。食物份量很大，足够 18 人吃。如果他们一起分享晚餐，他们本应该只需点多少份就恰好够 12 人吃？

$\textbf{(A)}\ 8 \qquad \textbf{(B)}\ 9 \qquad \textbf{(C)}\ 10 \qquad \textbf{(D)}\ 15 \qquad \textbf{(E)}\ 18$

Problem 4

Ms. Hamilton’s eighth-grade class wants to participate in the annual three-person-team basketball tournament. Lance, Sally, Joy, and Fred are chosen for the team. In how many ways can the three starters be chosen?

Hamilton 女士的八年级班级想参加一年一度的三人篮球团体赛。Lance，Sally，Joy 和 Fred 为待选队员。要从中选择三名作为先发球员，一共有多少种方法？

$\textbf{(A)}\ 2 \qquad \textbf{(B)}\ 4 \qquad \textbf{(C)}\ 6 \qquad \textbf{(D)}\ 8 \qquad \textbf{(E)}\ 10$

Problem 5

Ms. Hamilton's eighth-grade class wants to participate in the annual three-person-team basketball tournament. The losing team of each game is eliminated from the tournament. If sixteen teams compete, how many games will be played to determine the winner?

Hamilton 女士八年级的班级想参加一年一度的三人篮球团体赛。每场比赛的败队被淘汰出局。如果有 16 支球队参加比赛，将进行多少场比赛来决定最终的冠军？

$\textbf{(A)}\ 4 \qquad \textbf{(B)}\ 7 \qquad \textbf{(C)}\ 8 \qquad \textbf{(D)}\ 15 \qquad \textbf{(E)}\ 16$

Problem 6

After Sally takes 20 shots, she has made 55% of her shots. After she takes 5 more shots, she raises her percentage to 56%. How many of the last 5 shots did she make?

在 Sally 射击的 20 次中，有 55%的命中率。当她再多射击 5 次，则命中率提高到了 56%．那么最后射击的 5 次中，有几次命中？

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

Problem 7

An athlete's target heart rate, in beats per minute, is 80% of the theoretical maximum heart rate. The maximum heart rate is found by subtracting the athlete's age, in years, from 220. To the nearest whole number, what is the target heart rate of an athlete who is 26 years old?

运动员的目标心率（以每分钟心跳数为单位）是理论最大心率的 80%．将 220 减去运动员的年龄（以年为单位），即可得到理论最大心率。则一名 26 岁的运动员的目标心率是多少（精确到整数）？

$\textbf{(A)}\ 134 \qquad \textbf{(B)}\ 155 \qquad \textbf{(C)}\ 176 \qquad \textbf{(D)}\ 194 \qquad \textbf{(E)}\ 243$

Problem 8

Find the number of two-digit positive integers whose digits total 7.

求各个位上数字之和为 7 的两位正整数的个数。

$\textbf{(A)}\ 6 \qquad \textbf{(B)}\ 7 \qquad \textbf{(C)}\ 8 \qquad \textbf{(D)}\ 9 \qquad \textbf{(E)}\ 10$

Problem 9

The average of the five numbers in a list is 54. The average of the first two numbers is 48. What is the average of the last three numbers?

一列 5 个数的平均值为 54。已知前 2 个数的平均值为 48。则最后 3 个数的平均值是多少？

(A) 55 **(B)** 56 **(C)** 57 **(D)** 58 **(E)** 59

Problem 10

Handy Aaron helped a neighbor $1\frac{1}{4}$ hours on Monday, 50 minutes on Tuesday, from 8:20 to 10:45 on Wednesday morning, and a half-hour on Friday. He is paid $\$3$ per hour. How much did he earn for the week?

Handy Aaron 帮一邻居干活，周一花了$1\frac{1}{4}$小时，周二花了 50 分钟，周三早上从 8:20 干到 10:45，周五花了半小时。已知他的工资是每小时 3 美元。则他这周赚了多少钱？

(A) \$8 **(B)** \$9 **(C)** \$10 **(D)** \$12 **(E)** \$15

Problem 11

The numbers $-2, 4, 6, 9$ and 12 are rearranged according to these rules:

The largest isn't first, but it is in one of the first three places.
The smallest isn't last, but it is in one of the last three places.
The median isn't first or last.

What is the average of the first and last numbers?

对－2，4，6，9 和 12 这些数按照如下规则重新排序：

最大的数不在第一个位置，但它位于前三个位置中的某个位置。

最小的数不在最后一个位置，但它位于后三个位置中的某个位置。

中位数不在第一个或者最后一个位置。

那么第一个数和最后一个数的平均值是多少？

(A) 3.5 **(B)** 5 **(C)** 6.5 **(D)** 7.5 **(E)** 8

Problem 12

Niki usually leaves her cell phone on. If her cell phone is on but she is not actually using it, the battery will last for 24 hours. If she is using it constantly, the battery will last for only 3 hours. Since the last recharge, her phone has been on 9 hours, and during that time she has used it for 60 minutes. If she doesn't talk any more but leaves the phone on, how many more hours will the battery last?

Niki 的手机通常不关机。如果她的手机是开着的，但她实际上没有使用，那么电池将持续 24 小时。如果她一直使用手机，电池只能使用 3 个小时。自从最近一次充电以来，她的手机已经开机 9 小时，在这段时间里，她使用手机的时间是 60 分钟。如果她不再使用手机进行通话，而是让手机待机，那么电池还能用多少小时？

$\textbf{(A)}\ 7 \qquad \textbf{(B)}\ 8 \qquad \textbf{(C)}\ 11 \qquad \textbf{(D)}\ 14 \qquad \textbf{(E)}\ 15$

Problem 13

Amy, Bill and Celine are friends with different ages. Exactly one of the following statements is true.

I. Bill is the oldest.
II. Amy is not the oldest.
III. Celine is not the youngest.

Rank the friends from the oldest to the youngest.

Amy，Bill 和 Celine 是不同年龄的朋友。下面的 3 个论断中，只有一个是正确的。

I. Bill 年龄最大

II. Amy 不是最大的.

III. Celine 不是最小的.

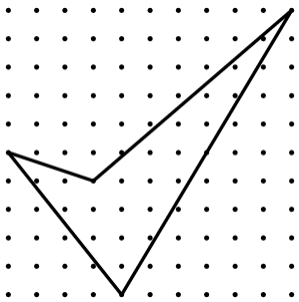
请把这 3 个朋友按照年龄从大到小排列。

$\textbf{(A)}$ Bill, Amy, Celine $\qquad \textbf{(B)}$ Amy, Bill, Celine $\qquad \textbf{(C)}$ Celine, Amy, Bill
$\textbf{(D)}$ Celine, Bill, Amy $\qquad \textbf{(E)}$ Amy, Celine, Bill

Problem 14

What is the area enclosed by the geoboard quadrilateral below?

由下图中几何板上的四边形包围的面积的是多少？



(A) 15 **(B)** $18\frac{1}{2}$ **(C)** $22\frac{1}{2}$ **(D)** 27 **(E)** 41

Problem 15

Thirteen black and six white hexagonal tiles were used to create the figure below. If a new figure is created by attaching a border of white tiles with the same size and shape as the others, what will be the difference between the total number of white tiles and the total number of black tiles in the new figure?

下图是由 13 块黑色瓷砖和 6 块白色瓷砖构成。若用同样大小和形状的若干块白色瓷砖在原来图形最外层再围成一圈，那么所形成的的新图形中，白色瓷砖的总个数和黑色瓷砖的总个数的差是多少？

(A) 5 **(B)** 7 **(C)** 11 **(D)** 12 **(E)** 18

Problem 16

Two 600 mL pitchers contain orange juice. One pitcher is $1/3$ full and the other pitcher is $2/5$ full.

Water is added to fill each pitcher completely, then both pitchers are poured into one large container. What fraction of the mixture in the large container is orange juice?

两个600mL的罐子里装了橙汁。其中一个罐子装了总容量的$1/3$,另一个罐子装了总容量的$2/5$。

向每个罐子加水，以使得两个罐子都装满液体。然后将两个罐子的液体都倒入同一个大的容器中。那么这个大的容器所装的混合物中，橙汁占了多少比例？

$\textbf{(A)}\ \frac{1}{8} \qquad \textbf{(B)}\ \frac{3}{16} \qquad \textbf{(C)}\ \frac{11}{30} \qquad \textbf{(D)}\ \frac{11}{19} \qquad \textbf{(E)}\ \frac{11}{15}$

Problem 17

Three friends have a total of 6 identical pencils, and each one has at least one pencil. In how many ways can this happen?

3 个朋友总共有 6 支一模一样的铅笔，并且每个人都有至少一支铅笔。那么一共有多少种可能的分配铅笔的方法？

$\textbf{(A)}\ 1 \qquad \textbf{(B)}\ 3 \qquad \textbf{(C)}\ 6 \qquad \textbf{(D)}\ 10 \qquad \textbf{(E)}\ 12$

Problem 18

Five friends compete in a dart-throwing contest. Each one has two darts to throw at the same circular target, and each individual's score is the sum of the scores in the target regions that are hit. The scores for the target regions are the whole numbers 1 through 10. Each throw hits the target in a region with a different value. The scores are: Alice 16 points, Ben 4 points, Cindy 7 points, Dave 11 points, and Ellen 17 points. Who hits the region worth 6 points?

五个朋友参加掷镖比赛。每个人都有两个飞镖向同一个圆形目标投掷，每个人的得分是被他击中的目标区域分值的总和。各个目标区域的分值是 1 到 10 的整数。每次投掷都击中到不同分值的目标区域。他们的分数是：Alice 得 16 分、Ben 得 4 分、Cindy 得 7 分、Dave 得 11 分，Ellen 得 17 分。谁击中了分值为 6 分的目标区域？

$\textbf{(A)}\ \text{Alice} \qquad \textbf{(B)}\ \text{Ben} \qquad \textbf{(C)}\ \text{Cindy} \qquad \textbf{(D)}\ \text{Dave} \qquad \textbf{(E)}\ \text{Ellen}$

Problem 19

A whole number larger than 2 leaves a remainder of 2 when divided by each of the numbers $3, 4, 5,$ and 6. The smallest such number lies between which two numbers?

一个大于 2 的正整数分别除以 3，4，5 和 6，所得余数均为 2。那么这个正整数的最小可能值在哪两个数之间?

(A) 40 and 49 **(B)** 60 and 79 **(C)** 100 and 129 **(D)** 210 and 249 **(E)** 320 and 369

Problem 20

Two-thirds of the people in a room are seated in three-fourths of the chairs. The rest of the people are standing. If there are 6 empty chairs, how many people are in the room?

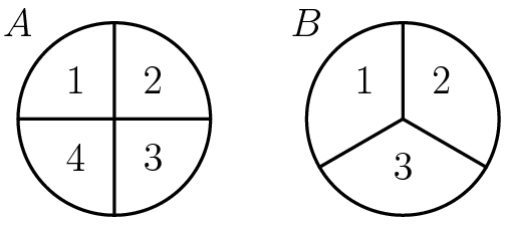
房间里的人坐在的椅子上。其余的人都站着。如果有 6 张空椅子，则房间里有多少人？

(A) 12 **(B)** 18 **(C)** 24 **(D)** 27 **(E)** 36

Problem 21

Spinners A and B are spun. On each spinner, the arrow is equally likely to land on each number. What is the probability that the product of the two spinners' numbers is even?

将转盘 A 和 B 各旋转一次。已知在每个转盘上，指针落在每个数字上的可能性都相同，那么这两个转盘上（指针所指的）数字之积为偶数的概率是多少？



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

Problem 22

At a party there are only single women and married men with their wives. The probability that a randomly selected woman is single is $\frac{2}{5}$. What fraction of the people in the room are married men?

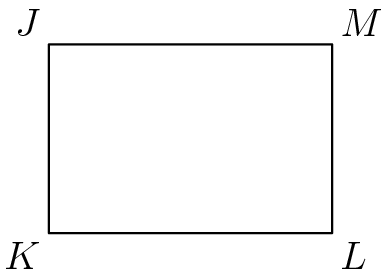
在某个聚会上，只有单身女性，以及已婚男性和他们的妻子。若随机选择一个女性，则她是单身的概率为$\frac{2}{5}$。那么这个房间的所有人中，已婚男性占了多少比例？

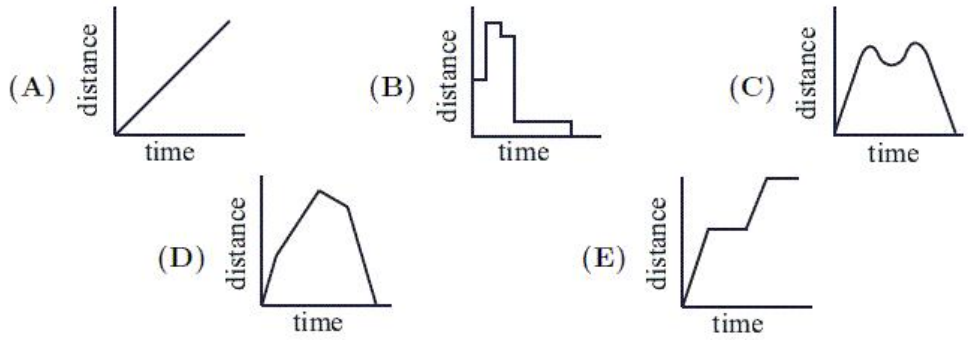
$\textbf{(A)}\ \frac{1}{3} \qquad \textbf{(B)}\ \frac{3}{8} \qquad \textbf{(C)}\ \frac{2}{5} \qquad \textbf{(D)}\ \frac{5}{12} \qquad \textbf{(E)}\ \frac{3}{5}$

Problem 23

Tess runs counterclockwise around rectangular block $JKLM$. She lives at corner J. Which graph could represent her straight-line distance from home?

Tess 沿着长方形方块 $JKLM$ 的边逆时针跑步。她住在角落 J，那么下面哪张图可以表示她距离家的直线距离？

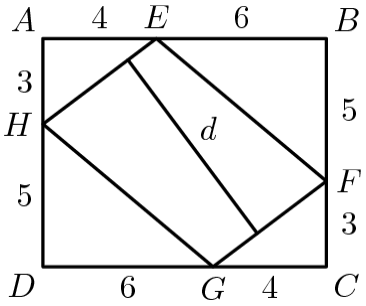




Problem 24

In the figure, $ABCD$ is a rectangle and $EFGH$ is a parallelogram. Using the measurements given in the figure, what is the length d of the segment that is perpendicular to $\overline{HE}$ and $\overline{FG}$?

如下图所示，*ABCD*是个矩形，*EFGH*是个平行四边形。使用图中所标线段的长度，则同时垂直于$\overline{HE}$和$\overline{FG}$的线段长度 d 是多少？

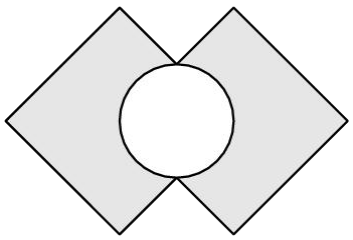


(A) 6.8 **(B)** 7.1 **(C)** 7.6 **(D)** 7.8 **(E)** 8.1

Problem 25

Two 4×4 squares intersect at right angles, bisecting their intersecting sides, as shown. The circle's diameter is the segment between the two points of intersection. What is the area of the shaded region created by removing the circle from the squares?

如图所示，两个 4 x 4 正方形以直角相交，将其相交的边平分。圆的直径是两个交点之间的线段。从正方形中去除圆之后所得到的阴影部分的面积是多少？



(A) $16-4\pi$ **(B)** $16-2\pi$ **(C)** $28-4\pi$ **(D)** $28-2\pi$ **(E)** $32-2\pi$

2004 AMC 8 Answer Key

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