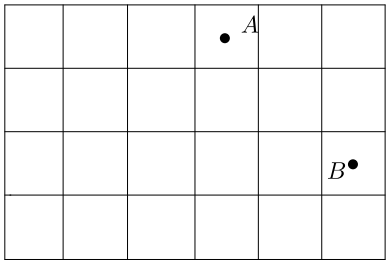
2024 AMC 8 Mock Nov

1 （1分）What is the value of $2024-2024\times(20+2024)\div 2024$?

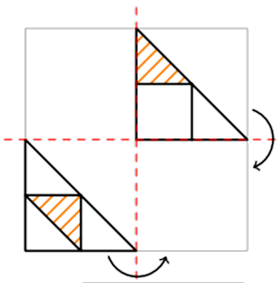
A. 0　　B. 20　　C. 2024　　D. -4048　　E. -20

2 （1分）As shown in the figure, point A is located at $(3,4)$, and point B is located at $(5,2)$. Which of the following points is not located within the grid?



A. $(1,3)$　　B. $(3,1)$　　C. $(6,1)$　　D. $(2,2)$　　E. $(5,3)$

3 （1分）The picture shows a piece of transparent paper with a design drawn on it. The paper is then folded twice, as shown. What would be seen on the folded paper?



A. 

B. 

C. 

D. 

E. 

4 （1分）A water purification system can purify 320 tons of water in 5 hours. At this rate, how many hours would it take to purify 576 tons of water?

A. 6　　B. 7　　C. 8　　D. 9　　E. 10

5 （1分）**The Heat Index** is a measure of how hot it feels when air temperature and dew point are factored in. The heat index can be estimated using the following formula:

$$\text{Heat Index} = 0.8 \times (\text{Air Temperature} + \text{Dew Point}) - 11,$$

where both the air temperature and dew point are measured in degrees Fahrenheit ($^\circ F$). Suppose the air temperature is 88 $^\circ F$ and the dew point is 65 $^\circ F$. Which of the following is closest to the approximate heat index?

A. 110 B. 111 C. 115 D. 120 E. 122

6 （1分）How many two-digit prime numbers have both their tens digit and units digit as prime numbers?

A. 2 B. 3 C. 4 D. 5 E. 6

7 （1分）Let P and Q be two numbers, and define the operation $P\triangle Q=\frac{P+Q}{3}$. What is the value of $6\triangle(9\triangle 18)$?

A. 3 B. 4 C. 5 D. 6 E. 7

8 （1分）Approximately how long is a millimonth, defined to be one-thousandth of a month?

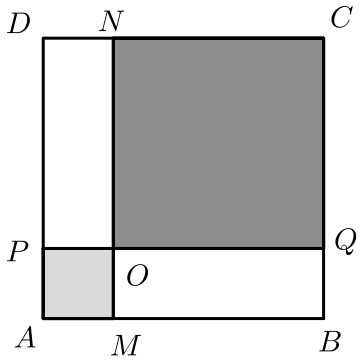
A. 20 seconds B. 70 seconds C. 8 minutes D. 40 minutes

E. 3 hours

9 （1分）Four ropes, each 10 cm long, are tied together to form a closed loop. The total length of the loop is 32 cm. How many centimeters of each rope are used at each knot? (Assume the length of each knot is negligible.)

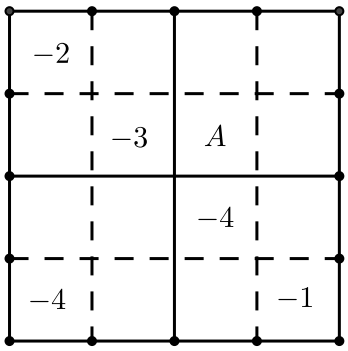
A. 0.5 cm B. 0.8 cm C. 1 cm D. 1.2 cm E. 1.5 cm

10 （1分）As shown in the figure, in the square $ABCD$, the area of the square $AMOP$ is $8\ \text{ft}^2$, and the area of the square $CNOQ$ is $24.5\ \text{ft}^2$. What is the area of the square $ABCD$ in square feet?



A. 56　　B. 60.5　　C. 62.5　　D. 64　　E. 80.5

11 （1分）The figure shows a mini Sudoku puzzle. The regions divided by solid lines are called boxes, and there are 4 boxes in total. Each box is further divided into 4 smaller cells by dashed lines. Based on the given hint numbers in the figure, fill the remaining empty cells with the numbers -1, -2, -3, and -4, ensuring that each number appears exactly once in each row, each column, and each box. What number should be filled in the cell at point A?



A. -1

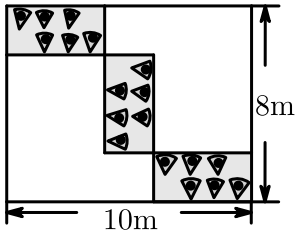
B. -2

C. -3

D. -4

E. None of the above

12 （1分）A rectangular plot of land measures 10 meters in length and 8 meters in width. It is divided into three smaller, identical rectangular flower beds, arranged parallel to the sides of the original rectangle, as shown in the diagram. What is the area of each smaller rectangular flower bed?



A. 5 m^2　　B. 6 m^2　　C. 8 m^2　　D. 10 m^2　　E. 12 m^2

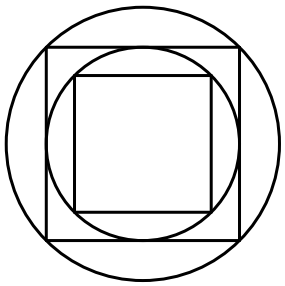
13 （1分）After the final exam, Teacher Winnie took a group photo with the children. There are 5 children in her class: 3 boys and 2 girls. For the photo, everyone must stand in a single line, with boys required to stand at both ends. How many different ways can they be arranged?

A. 36　　B. 54　　C. 144　　D. 156　　E. 216

14 （1分）What is the unit digit of $1^{23}+2^{23}+3^{23}+\ldots+20^{23}$?

A. 0　　B. 1　　C. 2　　D. 3　　E. 4

15 （1分）In the diagram, what fraction of the larger circle’s area is the area of the smaller circle?



A. $\frac{1}{4}$　　B. $\frac{1}{3}$　　C. $\frac{1}{2}$　　D. $\frac{2}{3}$　　E. $\frac{3}{5}$

16 （1分）Between 100 and 200, there are three consecutive positive integers where the smallest is divisible by 3, the middle one is divisible by 5, and the largest is divisible by 7. What is the sum of the digits of the middle number?

A. 7 B. 8 C. 9 D. 10 E. 11

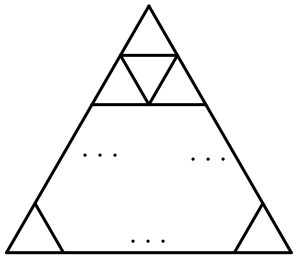
17 （1分）Sonia participated in a 1500-meter race. She ran part of the distance at a speed of 4 meters per second and the remaining distance at a speed of 6 meters per second, finishing the race in a total of 6 minutes. How many meters did Sonia run at 6 meters per second?

A. 120 B. 150 C. 160 D. 180 E. 480

18 （1分）Anna has 1000 dollars to buy 15 sets of costumes. There are two types: one costs 60 dollars per set, and the other costs 90 dollars per set. What is the maximum number of 90-dollar costumes Anna can buy?

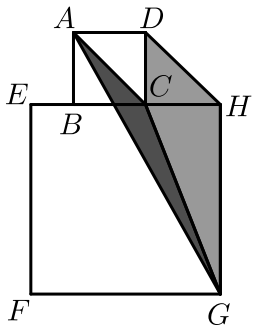
A. 3　　B. 4　　C. 5　　D. 6　　E. 7

19 （1分）Using three equal-length matchsticks, an equilateral triangle can be formed. Smaller equilateral triangles like this are arranged, as shown in the diagram, to create a larger equilateral triangle. If the base of the large equilateral triangle is made up of 10 matchsticks, how many matchsticks are needed in total?



A. 120　　B. 135　　C. 150　　D. 160　　E. 165

20 （1分）As shown in the figure, the area of square $ABCD$ is $36\ \text{ft}^2$ the area of square $EFGH$ is $256\ \text{ft}^2$, and the area of triangle ACG is $27\ \text{ft}^2$. What is the area of quadrilateral $CDHG$ in square feet?



A. 70 B. 72 C. 76 D. 77 E. 82

21 （1分）If the five-digit number $\overline{ab70c}$ is divisible by both 8 and 99, what is the value of $a+b+c$?

A. 12 B. 15 C. 18 D. 20 E. 24

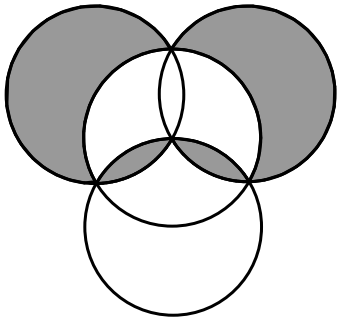
22 （1分）Ten identical balls are distributed among six children, A, B, C, D, E, and F, so that each child receives either 1 or 2 balls. How many different ways are there to distribute the balls?

A. 10 B. 11 C. 12 D. 15 E. 16

23 （1分）If a, b, and c are randomly selected (can be repeated) from the data set: $1, 2, 3, 4, 5$, what is the probability that $ab + c$ is an even number?

A. $\frac{2}{5}$ B. $\frac{59}{125}$ C. $\frac{1}{2}$ D. $\frac{64}{125}$ E. $\frac{3}{5}$

24 （1分）As the figure shown below, which consists of 4 identical circles, each with an area of 6 square centimeters. The 3 outer circles all pass through the center O of the middle circle, and the middle circle passes through the intersection points of any two outer circles. What is the total area of the shaded regions in square centimeters?



A. 4　　B. 6　　C. 8　　D. 10　　E. 12

25 （1分）In the sequence “□1□2□3□4□5□6□7□8□9,” you can fill each box with a “+” or “−” sign. If the algebraic sum of the sequence equals n, we say that n is a "representable number" (for example, 1 is a representable number because $+1+2-3-4+5+6-7-8+9=1$ is one way to represent it). How many different ways are there to represent 25?

A. 9　　B. 8　　C. 7　　D. 6　　E. 5