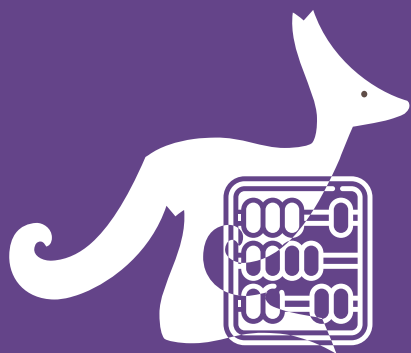




MATH KANGAROO CHINA

考试说明 / Instruction

Time allowed: 75 minutes

考试时长: 75 分钟

Language: English & Chinese

试卷语言: 英文和中文

This is a 30-question multiple-choice competition.

考试包含 30 道单项选择题。

Problems 1 to 10 are worth 3 points each.

1-10 题每题 3 分

Problems 11 to 20 are worth 4 points each.

11-20 题每题 4 分

Problems 21 to 30 are worth 5 points each.

21-30 题每题 5 分

1 point will be deducted for an incorrect answer and

no point for a blank answer.

答错扣 1 分, 不答不扣分。

The full score is 150 (Starting point is 30)

总分为 150 分 (起始分数为 30 分)

Do not open this booklet until you are told to do so.

收到监考老师指令后, 方可打开试卷册。

Mark your answers clearly on the answer sheet using a **2B pencil**.

务必使用 **2B 铅笔**在答题卡上正确填涂自己的答案。

Calculator cannot be used during the competition.

考试期间禁止使用计算器。

DO NOT discuss problems and solutions in any online or public forum until April 30.

4 月 30 日前请勿以任何形式公开讨论试题和答案。

**Grade 7
&
Grade 8**

3 points

1. Lisa has four wooden digits. She can use them to form the number 2025. Which of the following numbers is the largest she can form with these digits?

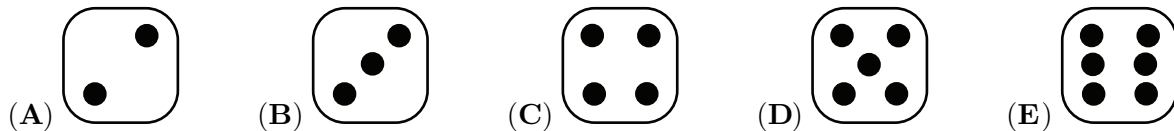


Lisa 有四个木制的数字块。她可以利用这些数字块拼出数字 2025。请问以下哪一项是她可以用这些数字块拼出的最大数字？

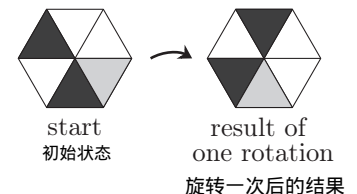
- (A) 2502 (B) 5202 (C) 5220 (D) 5502 (E) 5520

2. Sandra rolls three dice and gets a total of 8. All three dice show a different number of dots. Which number of dots could Sandra not have rolled on any of her dice?

Sandra 掷出三枚骰子，总点数为 8。三枚骰子显示的点数各不相同。请问 Sandra 不可能掷出以下哪个点数？



3. Isabelle rotates the hexagonal sheet of paper, as shown. Each rotation turns the hexagon through the same angle in the same direction. The figure shows the result of one rotation.



Which of these numbers of rotations would leave the sheet looking the same as it did at the start?

Isabelle 旋转一张六边形纸张，如图所示。每次旋转，六边形都朝着同一方向旋转相同角度。图中展示了旋转一次后的结果。

请问旋转多少次后，这张纸看起来和初始状态时一样？

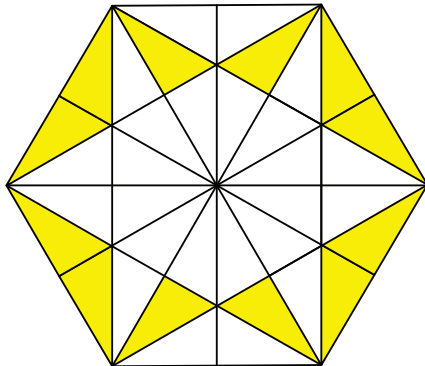
- (A) 7 (B) 8 (C) 9 (D) 10 (E) 12

4. The regular hexagon shown is divided into many triangles of equal area.

Which fraction of the hexagon is unshaded?

如图所示，正六边形被分成了许多个面积相等的三角形。

请问非阴影部分占六边形的几分之几？



- (A) $\frac{2}{3}$ (B) $\frac{3}{4}$ (C) $\frac{4}{5}$ (D) $\frac{5}{6}$ (E) $\frac{6}{7}$

5. How many lots of 12 minutes are there in 12 hours?

请问 12 小时里有多少个 12 分钟？

- (A) 60 (B) 24 (C) 12 (D) 10 (E) 6

6. Daniel is 5 years old. His brother Dominic is 6 years older.

What will the sum of their ages be in 7 years' time?

Daniel 今年 5 岁，他的哥哥 Dominic 比他大 6 岁。

请问 7 年后，两人的年龄之和是多少？

- (A) 26 (B) 27 (C) 28 (D) 29 (E) 30

7. Ohad wants to write the four digits 2, 0, 2 and 5 in the four boxes of the calculation shown.

$$\square - \square + \square - \square$$

What is the smallest result that Ohad could get?

Ohad 想将 2、0、2 和 5 四个数字填入图中算式的四个方框中。

请问他能得到的最小结果是多少？

- (A) -7 (B) -6 (C) -5 (D) -4 (E) -3

8. There are ten more truth-tellers than liars in a room. Everyone in the room was asked, “Are you a truth-teller?” and everyone gave an answer. A total of 20 people answered, “Yes.”

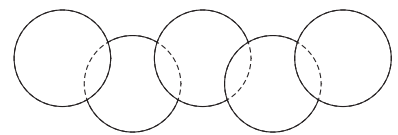
How many truth-tellers are in the room?

房间里说真话的人比说谎话的人多 10 个。房间里每个人都被问到：“你是说真话的人吗？”并且每个人都做出了回答，一共有 20 个人回答“是”。

请问房间里有多少个说真话的人？

- (A) 0 (B) 5 (C) 15 (D) 20 (E) 25

9. Five circles, each with an area of 8 cm^2 , overlap to form the figure shown. The area of each section where two circles overlap is 1 cm^2 .



What is the total area covered by the figure?

五个面积均为 8 cm^2 的圆重叠，形成了如图所示的图形。每两个圆之间重叠部分的面积是 1 cm^2 。

请问这个图形覆盖的总面积是多少？

- (A) 32 cm^2 (B) 36 cm^2 (C) 38 cm^2 (D) 39 cm^2 (E) 42 cm^2

10. The real combination for the bicycle lock shown in the picture is 0000. However, when someone looks at it from the side, they see 8888.

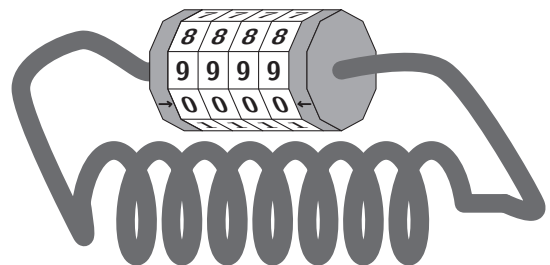
When Paul looks at the combination of his friend's lock from the side, he sees 8417.

What is the real combination of his friend's lock?

图中自行车锁的真实密码是 0000。然而，当有人从侧面看时，他们看到的是 8888。

当 Paul 从侧面看他朋友的锁的密码时，他看到的是 8417。

请问他朋友的锁的真实密码是多少？



- (A) 4037 (B) 4693 (C) 0639 (D) 0693 (E) 9603

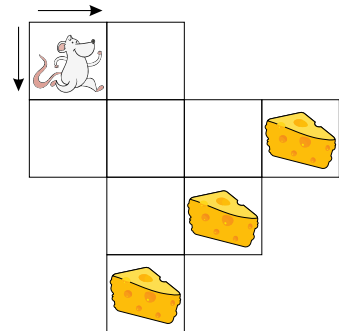
4 points

11. Matjaz the mouse wants to get to a piece of cheese. He can only move horizontally or vertically between any two cells in the directions shown by the arrows.

How many different routes can Matjaz take to reach a piece of cheese?

小老鼠 Matjaz 想吃一块奶酪。它只能按照箭头所示的方向，在任意两个单元格之间水平或垂直移动。

请问 Matjaz 有多少条不同的路线可以吃到奶酪？



- (A) 3 (B) 5 (C) 8 (D) 10 (E) 11

12. There are five hurdles in a 60 m hurdles race. The first hurdle is after 12 m. The gap between any two consecutive hurdles is 8 m.

How far is the last hurdle from the finish?

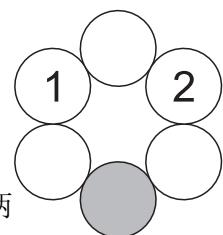
一场 60 m 的跨栏比赛中有五个栏架。第一个栏架在 12 m 处。任意两个相邻栏架之间的距离是 8 m。

请问最后一个栏架离终点有多远？

- (A) 16 m (B) 14 m (C) 12 m (D) 10 m (E) 8 m

13. Edgar wants to write a number in each circle in the diagram. He wants each number to be equal to the sum of the numbers in the two adjacent circles. He has already written two numbers, as shown. What number should he write in the grey circle?

Edgar 想在图中的每个圆圈里填入一个数字。他希望每个数字等于与它相邻的两个圆圈里的数字之和。他已经填好了两个数字，如图所示。请问他应该在灰色圆圈里填入哪个数字？



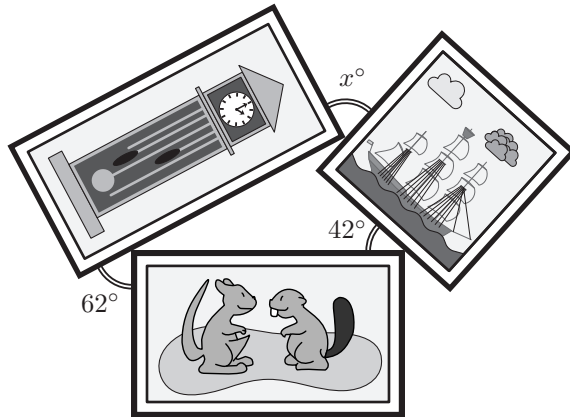
- (A) 2 (B) -1 (C) -2
(D) -3 (E) -5

14. Louise places three rectangular pictures in the way shown.

What is the value of x ?

Louise 把三张矩形图片按如图所示的方式摆放。

请问 x 的值是多少?



(A) 64

(B) 70

(C) 72

(D) 76

(E) 80

15. Werner is on a treadmill in the gym. He keeps looking at two stopwatches. The first shows the time elapsed since he started his session and the second the time remaining until the end of his session.

Werner 在健身房里的跑步机上锻炼。他一直盯着两个秒表。第一个秒表显示他开始锻炼以来经过的时长，第二个秒表显示距离锻炼结束还剩下的时间。

14:58	21:32
-------	-------

At some point the two stopwatches show the same reading.

What do they show at that point?

在某个时刻，两个秒表显示的时间相同。

请问在这个时刻，秒表上显示的时间是什么?

(A) 17:50

(B) 18:00

(C) 18:12

(D) 18:15

(E) 18:20

16. Julia wants to fill each $\square$ with a different prime number less than 20 so that the value of A is an integer.

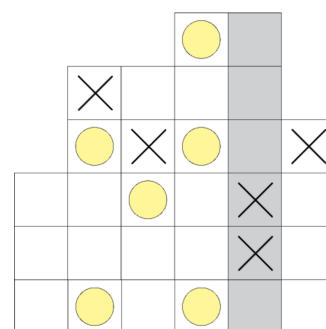
What is the maximum value of A ?

Julia 想在每个 $\square$ 里填入一个不同的质数，且这些质数都小于 20，使得 A 的值是一个整数。请问 A 的最大值是多少？

$$A = \frac{\square + \square + \square + \square + \square + \square + \square}{\square}$$

- (A) 20 (B) 14 (C) 10 (D) 8 (E) 6

17. Morten wants to fill in the cells on the diagram shown so that each cell contains either a cross or a circle. He also wants to ensure there is no line of four consecutive identical symbols in any column, row or diagonal. When has completed the diagram, what will the column coloured grey contain?



Morten 想在图中的每个格子里填入一个叉号或一个圆圈。并且他想确保在任何一列、一行或对角线上都没有四个连续相同的符号。请问当他填完所有格子后，灰色列里会有什么？

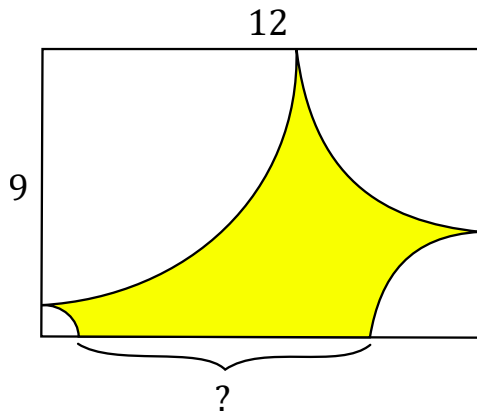
- (A) 3 circles and 3 crosses 3 个圆圈和 3 个叉号
 (B) 2 circles and 4 crosses 2 个圆圈和 4 个叉号
 (C) 4 circles and 2 crosses 4 个圆圈和 2 个叉号
 (D) 5 circles and a cross 5 个圆圈和 1 个叉号
 (E) a circle and 5 crosses 1 个圆圈和 5 个叉号

18. Peter has drawn a quarter circle with centre at each corner of a flag with dimensions 12 cm by 9 cm and coloured the region formed, as shown.

What is the length indicated by the question mark?

Peter 在一面尺寸为 12 cm × 9 cm 的旗子上以四个角为圆心分别画了一个四分之一圆，并给剩下的区域涂上了颜色，如图所示。

请问图中问号表示的长度是多少？



- (A) 5 cm (B) 6 cm (C) 7 cm (D) 8 cm (E) 9 cm

19. Sanja has two bowls of numbered balls. Bowl X contains seven balls numbered 1, 2, 6, 7, 10, 11 and 12. Bowl Y contains five balls numbered 3, 4, 5, 8, and 9. Which ball should Sanja transfer from Bowl X to Bowl Y to increase the average number on the balls in each bowl?

Sanja 有两个装有编号球的碗。碗 X 里有七个球，编号分别为 1、2、6、7、10、11 和 12。碗 Y 里有五个球，编号分别为 3、4、5、8 和 9。请问 Sanja 应该把哪个球从碗 X 移到碗 Y，才能使每个碗里球的编号的平均值都增加？

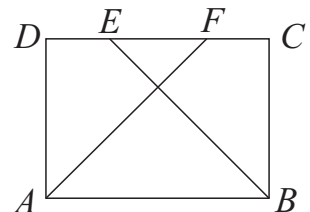
- (A) 6 (B) 7 (C) 10 (D) 11 (E) 12

20. In the rectangle $ABCD$, the points E and F are marked on side DC , as shown, so that $\angle EBA = \angle DFA = 45^\circ$ and $AB + EF = 20$ cm.

What is the length of BC ?

在长方形 $ABCD$ 中，点 E 和点 F 在边 DC 上，如图所示，使得 $\angle EBA = \angle DFA = 45^\circ$ ，且 $AB + EF = 20$ cm。

请问 BC 的长度是多少？



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

5 points

21. In the six-digit integer $PAPAYA$, different letters stand for different digits and the same letter always represents the same digit. Also $Y = P + P = A + A + A$.

What is the value of $P \times A + P + A \times Y \times A$?

在六位整数 $PAPAYA$ 中，不同的字母代表不同的数字，而相同的字母总是代表相同的数字。

并且， $Y = P + P = A + A + A$ 。

请问 $P \times A + P + A \times Y \times A$ 的值是多少？

- (A) 33 (B) 39 (C) 66 (D) 132 (E) 252

22. During two sessions of football training, Paul shoots a total of 17 times at a target. He hits with 60% of the shots he shoots in the first session. He hits with 75% of the shots he shoots in the second session.

How many times did he hit the target in the first session?

在两场足球训练中，Paul 一共向目标射门 17 次。他在第一场训练中的命中率是 60%，在第二场训练中的命中率是 75%。

请问他在第一场训练中射中目标多少次？

- (A) 3 (B) 5 (C) 6 (D) 8 (E) 10

23. Anurag always leaves for school at 8:00 a.m. His school is 1 km away. When he walks, his speed is 4 km/h. When he cycles, his speed is 15 km/h. He is 5 minutes early when he walks. How many minutes early is he when he cycles?

Anurag 总是在早上 8 点出发去学校。学校距离他家 1 km。他步行的速度是 4 km/h，骑车的速度是 15 km/h。他步行时会提前 5 分钟到校。请问他骑车时会提前多少分钟到校？

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

24. Ria draws four squares side by side, as shown.

What is the area of the shaded quadrilateral?

Ria 画了四个紧密排列的正方形，如图所示。

请问阴影四边形的面积是多少？

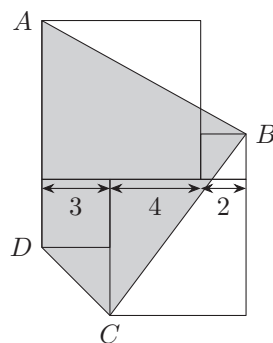
(A) 54

(B) 60

(C) 66

(D) 72

(E) 80



25. The letters p, q, r, s and t represent five consecutive positive integers, though not necessarily in that order. The sum of p and q is 69 and the sum of s and t is 72. What is the value of r ?

字母 p, q, r, s 和 t 代表五个连续的正整数，但顺序不一定如此。 p 与 q 之和是 69， s 与 t 之和是 72。请问 r 的值是多少？

(A) 29

(B) 31

(C) 34

(D) 37

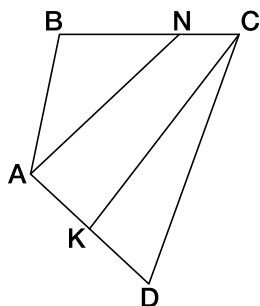
(E) 39

26. In the quadrilateral $ABCD$, the points N and K are marked on sides BC and AD respectively so that $BN = 2NC$ and $AK = KD$. The area of triangle CKD is 3, and the area of triangle ABN is 4.

What is the area of quadrilateral $ABCD$?

在四边形 $ABCD$ 中，点 N 和点 K 分别在边 BC 和边 AD 上，且 $BN = 2NC$ ， $AK = KD$ 。三角形 CKD 的面积是 3，三角形 ABN 的面积是 4。

请问四边形 $ABCD$ 的面积是多少？



(A) 11

(B) 12

(C) 13

(D) 14

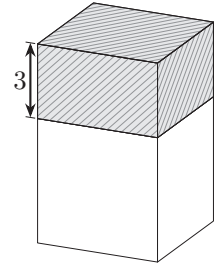
(E) 15

27. When the height of a cuboid is reduced by 3 cm, its surface area is reduced by 60 cm^2 . The resulting shape is a cube.

What is the volume of the original cuboid, in cm^3 ?

若一个长方体的高减少 3 cm，则它的表面积就会减少 60 cm^2 ，并且会变成一个正方体。

请问原长方体的体积是多少 cm^3 ?



- (A) 75 (B) 125 (C) 150 (D) 200 (E) 225

28. Some birds, including Ha, Long, Nha and Trang, are perching on four parallel wires. There are 10 birds perched above Ha. There are 25 birds perched above Long. There are five birds perched below Nha. There are two birds perched below Trang. The number of birds perched above Trang is a multiple of the number of birds perched below her.

How many birds in total are perched on the four wires?

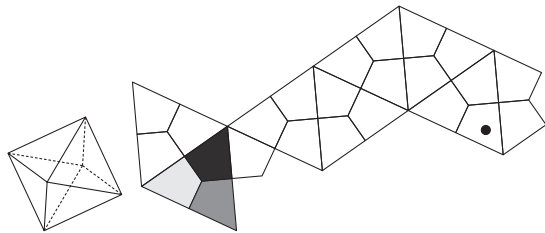
Ha、Long、Nha 和 Trang 等一些鸟停在四根平行的电线上。Ha 上方有 10 只鸟，Long 上方有 25 只鸟，Nha 下方有 5 只鸟，Trang 下方有 2 只鸟。Trang 上方的鸟的数量是她下方的鸟的数量的倍数。

请问四根电线上总共停着多少只鸟?

- (A) 27 (B) 30 (C) 32 (D) 37 (E) 40

29. The right-hand figure below shows the adapted net of an octahedron. Each face of the octahedron is divided into three parts. The octahedron is coloured with the three colours black, dark grey and light grey in such a way so that the parts that come out of the same vertex or out of an opposite vertex are the same colour. Which colour could the part marked with a dot be coloured?

下图右侧展示了一个经过调整的八面体的展开图，八面体的每个面都被分成了三个部分。用黑色、深灰色和浅灰色三种颜色给这个八面体上色，使得从同一个顶点和其相对顶点延伸出来的部分颜色相同。请问图中标有黑点的部分可能是什么颜色？



- (A) Only black 只能是黑色
- (B) Only dark grey 只能是深灰色
- (C) Only light grey 只能是浅灰色
- (D) Both black and dark grey are possible. 黑色和深灰色都有可能。
- (E) Both black and light grey are possible. 黑色和浅灰色都有可能。

30. Adira keeps golden, red, black, pink and white pearls in five small boxes. Each box contains pearls of only one colour. The boxes are labeled as shown, and all the labels are true. Adira's friend Lilly wants to know which box contains the golden pearls. She may open exactly one of the five boxes to look inside.

Which box should Lilly open to be certain which of the boxes contains the golden pearls?

Adira 有五个小盒子，盒子里分别装着金色、红色、黑色、粉色和白色的珍珠。每个盒子里只有一种颜色的珍珠。盒子上贴有标签，如图所示，且所有标签都是正确的。Adira 的朋友 Lilly 想知道哪个盒子里装着金色珍珠。她只能打开其中一个盒子进行查看。

请问 Lilly 应该打开哪个盒子，才能确定金色珍珠的位置？

- (A) 金色或红色
- (B) 粉色或黑色
- (C) 黑色或金色
- (D) 不是黑色
- (E) 粉色或白色