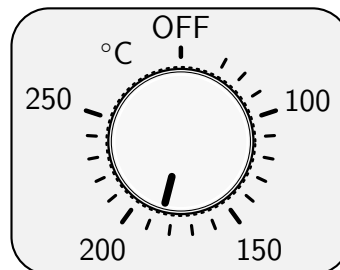


Junior Division

Questions 1 to 10, 3 marks each

1-10 題，每題 3 分

1. Owen set the temperature dial on his oven as shown. What temperature is it set to?
小歐將烤箱溫度調至如圖所示的位置。請問他設定的溫度是多少？



- (A) 175°C (B) 185°C (C) 195°C (D) 205°C (E) 215°C

2. If the day before yesterday was Monday, then the day after tomorrow will be
如果前天是星期一，那麼後天將是

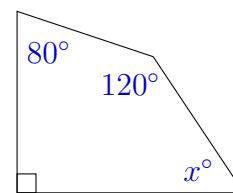
- (A) Monday (B) Tuesday (C) Wednesday (D) Thursday (E) Friday
星期一 星期二 星期三 星期四 星期五

3. The metal in an Australian 20 cent coin is one-quarter nickel, and the rest is copper. What fraction is copper?
一枚澳大利亞 20 分硬幣中的金屬有四分之一是鎳，其餘為銅。請問銅的占比是多少？



- (A) $\frac{3}{4}$ (B) $\frac{1}{2}$ (C) $\frac{1}{4}$ (D) $\frac{4}{4}$ (E) 0

4. What is the value of x in the diagram?
請問圖中 x 的值是多少？



- (A) 40 (B) 50 (C) 60 (D) 70 (E) 80

5. The value of $\frac{2024}{2+0+2+4}$ is

請問 $\frac{2024}{2+0+2+4}$ 的值是多少？

- (A) 1 (B) 126.5 (C) 253 (D) 506 (E) 1012

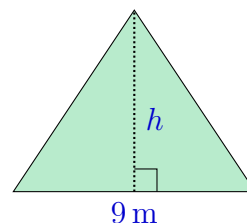
6. What is the difference between $3 \times (4 + 2)$ and $(3 \times 4) + 2$?

請問 $3 \times (4 + 2)$ 與 $(3 \times 4) + 2$ 的差是多少?

- (A) 0 (B) 2 (C) 4 (D) 6 (E) 8

7. The area of the triangle shown is 36 m^2 . What is the length h ?

圖中所示三角形的面積是 36 m^2 。請問該三角形中 h 的長度為多少?



- (A) 2 m (B) 4 m (C) 4.5 m (D) 8 m (E) 16 m

8. The average of 2024 and an unknown number is $2\frac{1}{2}$. What is the unknown number?

2024 與一個未知數的平均數為 $2\frac{1}{2}$ 。請問這個未知數是多少?

- (A) 2019 (B) -2019 (C) 2029 (D) -2029 (E) -2024

9. The *Balga* is a grass tree found in south-western Australia.

Balgas grow between 1 and 2 centimetres taller each year.

Approximately how old is a Balga that is 4 metres tall?

巴爾加是一種生長在澳大利亞西南部的草樹，每年可以長高

1 cm 到 2 cm。請問一棵巴爾加草樹大約需要幾年才能長到 4 m?



- (A) 10 years 10 年
(B) 30 years 30 年
(C) 60 years 60 年
(D) 300 years 300 年
(E) 1000 years 1000 年

10. What number must be divided by 100 to get 0.2?

請問下列哪個數字除以 100 的結果為 0.2?

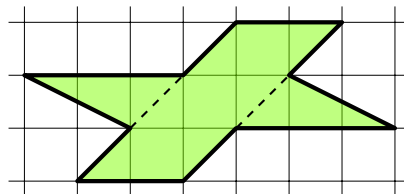
- (A) 0.002 (B) 0.02 (C) 0.2 (D) 2 (E) 20

Questions 11 to 20, 4 marks each

11-20 題, 每題 4 分

11. What is the area of the shape drawn in the grid?

請問網格中圖形的面積是多少？



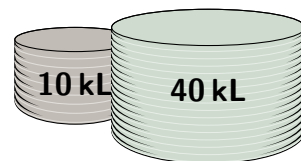
- (A) 7 (B) 8 (C) 9 (D) 10 (E) 11

12. Danilo's pasta recipe requires one 60-gram egg for each 100 grams of flour, and no other ingredients. To make 800 grams of pasta, how many eggs does he need?

小洛的意麵食譜上寫明：每 100 g 麵粉搭配一個 60 g 的雞蛋，且無需其他配料。請問製作 800 g 的意麵需要多少個雞蛋？

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

13. We have two water tanks for bushfire emergencies. The 10 kL tank is 80% full and the 40 kL tank is 30% full. Regulations state that we must have at least 30 kL available. How much more water do we need to add to our tanks?

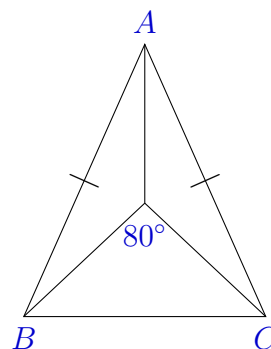


我們有兩個用於撲救森林火災的水箱。容量為 10 kL 的水箱裝有 80% 的水，而容量為 40 kL 的水箱裝有 30% 的水。根據規定，我們必須保證至少有 30 kL 的水可供使用。請問還需要向水箱中加多少水才符合規定？

- (A) 0 kL (B) 5 kL (C) 10 kL (D) 15 kL (E) 20 kL

14. The isosceles triangle ABC is divided into three smaller isosceles triangles as shown. What is the value, in degrees, of $\angle ABC$?

如圖所示，等腰三角形 ABC 被分割成三個較小的等腰三角形。請問 $\angle ABC$ 是多少度？



- (A) 50 (B) 55 (C) 60 (D) 65 (E) 70

15. In this square, all rows and columns have the same sum.

Find the average of A , B , C and D .

在這個正方形方陣中，每一行和每一列的元素之和相等。請計算 A 、 B 、 C 、 D 這四個數的平均值。

A	11	B
X	5	Y
D	7	C

- (A) 7 (B) 8 (C) 9 (D) 10 (E) 11

16. I have a pad of 100 sticky notes. Each note is a $75\text{ mm} \times 75\text{ mm}$ square. Using most of the pad, I completely cover all the faces of a cube. None of the notes folds over an edge of the cube. What is the largest side length of the cube could be?

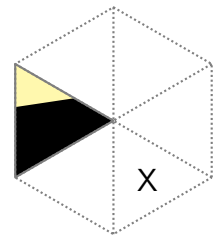
我幾乎用完一本 100 張尺寸為 $75\text{ mm} \times 75\text{ mm}$ 的正方形便簽紙。使用過的便簽紙可以完全覆蓋一個立方體的所有表面，且沒有便簽紙在這個立方體的邊緣處折疊。請問這個立方體可能的最大邊長是多少？



- (A) 22.5 cm (B) 30 cm (C) 45 cm (D) 60 cm (E) 75 cm

17. A regular hexagon made from yellow cardboard has a thick black stripe painted across it. The hexagon is cut up into six equilateral triangles and the pieces are mixed up. This diagram shows one of the pieces in its original position.

一條粗黑條紋橫穿一個由黃色紙板製成的正六邊形。將該正六邊形切割成 6 個等邊三角形後打亂重排。圖中顯示了其中一個三角形的原始位置。

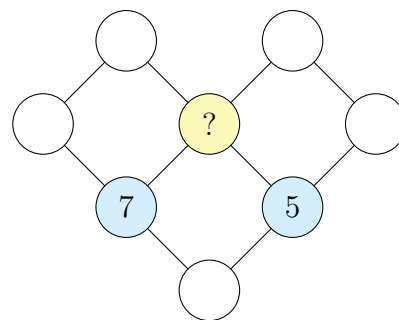


The other five pieces are shown in options (A) to (E). Which piece was in the position marked with the X?

選項 (A) 到 (E) 中展示了其餘 5 個三角形。請問下列哪個三角形原本處於標記為 X 的位置上？

- (A) (B) (C) (D) (E)

18. In this puzzle, the numbers from 1 to 8 are to be placed in the 8 circles. For each of the 3 squares, the sum of the 4 numbers on the corners must be 20. With 5 and 7 placed as in the diagram, what number goes in the middle circle?

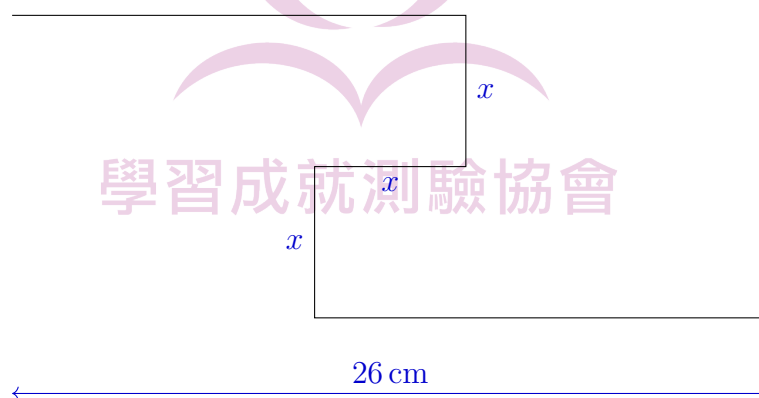


這道謎題中，你需要將數字 1 到 8 放置在 8 個圓圈裏。圖中有 3 個正方形，每個正方形 4 個角上圓圈中的數字之和必須是 20。數字 5 和 7 的位置如圖所示，請問中間的圓圈應該填入什麼數字？

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 6

19. A piece of wire of length 50 cm is bent into the shape shown, where each bend in the wire forms a right angle. The three internal sections of the bent wire are each the same length, x cm. What is the value of x ?

一根 50 cm 長的鐵絲被彎曲成如圖所示的形狀，其中每個彎曲處都構成一個直角。彎曲後的鐵絲中有三段長度均為 x cm。請問 x 的值是多少？



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

20. A three-digit number has all digits nonzero. These digits are multiplied together and then this product is subtracted from the original number. What is the largest possible value of this difference?

一個三位數，其各位數字均不為 0。先將各位數字相乘，然後用原數減去所得乘積。請問最大可能差值是多少？

- (A) 890 (B) 901 (C) 909 (D) 910 (E) 990

Questions 21 to 25, 5 marks each

21-25 題, 每題 5 分

21. A long line of ping-pong balls numbered 1, 2, 3, ... is sitting in order in a tilted chute, as shown below.

如圖所示, 一排編號為 1, 2, 3, ... 的乒乓球按順序排列在一個傾斜的滑槽中。

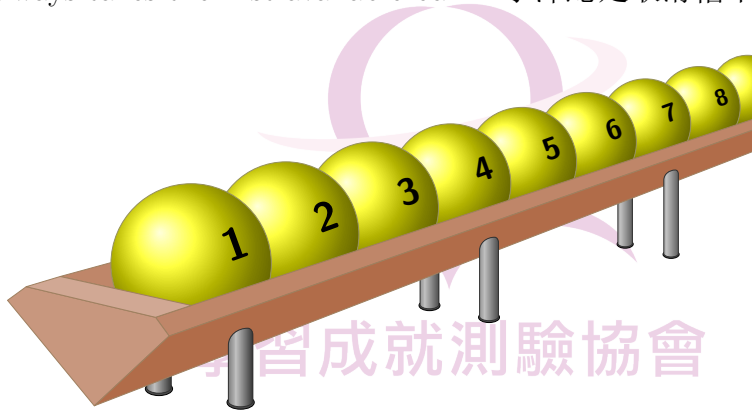
Xavier, Yasmin and Zebedee take turns removing balls from the chute. When a ball is removed, the rest roll down to fill the gap. When Zebedee has taken his ball, it is Xavier's turn again and they continue in the same order for as long as there are balls remaining.

小西、小雅和小澤輪流從滑槽中取球。當一個球被取出時, 剩下的球會滾落填補空缺。當小澤取走他的球後, 再次輪到小西取球。然後按照同樣的順序繼續取球, 直到沒有剩餘的球為止。

Xavier always takes the second available ball. 小西總是取滑槽中的第二個球。

Yasmin always takes the third available ball. 小雅總是取滑槽中的第三個球。

Zebedee always takes the first available ball. 小澤總是取滑槽中的第一個球。

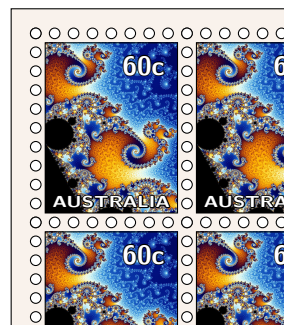


Which statement is **true**?

請問下列哪個陳述是**正確**的?

- (A) Xavier takes ball 48. 小西取走了編號為 48 的球。
- (B) Yasmin takes ball 49. 小雅取走了編號為 49 的球。
- (C) Zebedee takes ball 50. 小澤取走了編號為 50 的球。
- (D) Yasmin takes ball 51. 小雅取走了編號為 51 的球。
- (E) Xavier takes ball 52. 小西取走了編號為 52 的球。

22. To make the stamps easier to pull apart, sheets of postage stamps have rows of holes punched into them. In the sheet shown, each stamp has 7 holes along the top and bottom edges, 9 holes along the sides and 1 more at each corner. Holes are included around all four edges of the sheet so the borders can be torn off as well. The full sheet has 20 stamps arranged in 4 rows of 5. How many holes are there altogether?

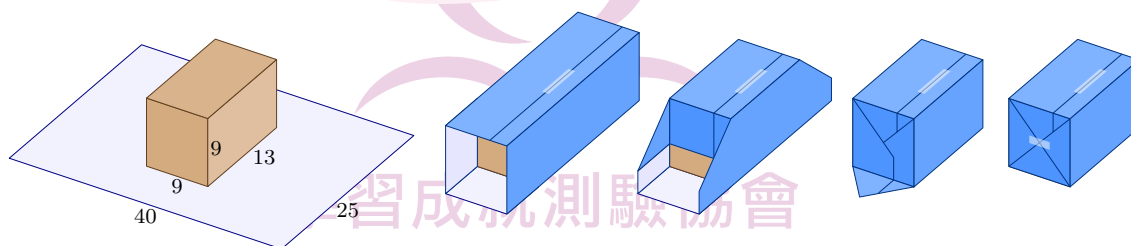


版票上設有便於撕開郵票的孔。在所示的版票中，每單張郵票的上下邊緣各有 7 個孔，兩側各有 9 個孔，郵票的四個角額外還有 1 個孔。版票四周邊緣也設計了孔，以便邊緣部分也能被撕下。整版郵票上共有 20 張單張郵票，每 5 張為一排，共 4 排。請問整版郵票上總共有多少個孔？

- (A) 320 (B) 391 (C) 421 (D) 451 (E) 640

23. Amisha is wrapping a present for her little brother. The present is in a box measuring $9\text{ cm} \times 9\text{ cm} \times 13\text{ cm}$ and the sheet of wrapping paper is $40\text{ cm} \times 25\text{ cm}$. She wraps the present as tightly as possible, as shown.

小莎正在為她的弟弟包裝禮物。禮物裝在一個尺寸為 $9\text{ cm} \times 9\text{ cm} \times 13\text{ cm}$ 的盒子裏，然後用尺寸為 $40\text{ cm} \times 25\text{ cm}$ 的包裝紙將盒子盡可能緊實地包裹好，如圖所示。



What percentage of the wrapping paper is no longer visible from any angle?

請問從任一角度看，包裝紙不可見部分的占比是多少？

- (A) 25% (B) 30% (C) 33% (D) 37% (E) 42%

24. A *totally even number* is a positive integer in which all the digits are even. The list of all totally even numbers begins as follows:

全偶數是指一個每位數字都是偶數的正整數。一個所有元素均為全偶數的數列如下：

$$2, 4, 6, 8, 20, 22, 24, 26, 28, 40, \dots$$

The number 40 is in the 10th position in this list. In which position is the totally even number 2024?

在這個數列中，數字 40 排在第 10 位。請問全偶數 2024 排在該數列的第幾位？

- (A) 57 (B) 132 (C) 257 (D) 512 (E) 1012

25. Sally arranges the numbers from 1 to 8 in a circle and then calculates the sum of each set of 3 adjacent numbers. She would like an arrangement in which the smallest of these sums is as large as possible. If she chooses such an arrangement, what will this smallest sum be?

小莉把數字 1 到 8 排成一個圈，然後以每 3 個相鄰數字為一組，計算每組數字的總和。她期望找到一種排列方式，使得這些總和中的最小值盡可能大。如果按照小莉的想法排列，請問其中最小總和是多少？

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

For questions 26 to 30, shade the answer as an integer from 0 to 999 in the space provided on the answer sheet.

問題 26-30 的答案為 0-999 之間的整數，請將答案填塗在答題卡對應區域。

Questions 26–30 are worth 6, 7, 8, 9 and 10 marks, respectively.

第 26-30 題分別為 6, 7, 8, 9, 10 分。

26. Ringo has 5 cards with the numbers 2, 3, 4, 5 and 6 on them. He wrote a list of all possible two-digit numbers that can be made with these cards. Find the sum of all numbers in his list.



小林有 5 張卡片，每張卡片上分別寫有數字 2、3、4、5、6。他列出一個數列包括所有可能使用這些卡片組成的兩位數。請問小林列出的所有可能的兩位數的總和是多少？

27. A rectangular piece of paper would lose 999 cm^2 of area if a 3 cm wide border was trimmed from all four sides. If instead the trimmed border was 2 cm wide, what area, in square centimetres, would be lost?

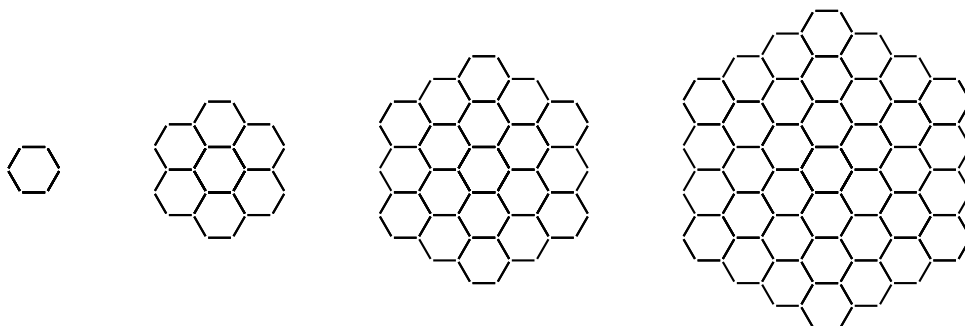
假設將一張矩形紙張的四周各剪去 3 cm 寬的邊，其面積會減少 999 cm^2 。如果將同一張矩形紙張的四周各剪去 2 cm 寬的邊，請問其面積將會減少 cm^2 ？

28. A farmer, Jenni, grows oranges and grapefruit. At her last harvest she picked 120 grapefruit and a number of oranges. However, one-tenth of all grapefruit look like oranges and one-tenth of all oranges look like grapefruit. Overall, one-fifth of all fruits look like grapefruit. How many oranges did Jenni harvest?

農民小詹種植了橙子和柚子。在最近的一次收穫中，小詹收穫了 120 個柚子和大量橙子。其中，柚子中有十分之一看起來像橙子，而橙子中也有十分之一看起來像柚子。從整體上看，小詹收穫的所有水果中有五分之一看起來像柚子。請問小詹收穫了多少個橙子？

29. Rodney builds increasingly large shapes out of unit rods. The smallest uses six rods and each larger shape adds a layer of hexagons around the previous shape.

小羅使用單位長度的棍子構建圖形，且這些圖形逐漸增大。最小的圖形使用六根棍子，之後的每個圖形都是通過在前一個圖形周圍加一層六邊形構建而成的。

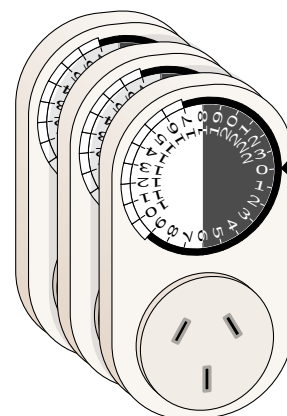


Starting with 2024 rods, Rodney builds a single shape like this, as large as possible. How many rods will he have left over?

小羅使用 2024 根棍子構建一個盡可能大的圖形。請問他最後還能剩下多少根棍子？

30. Tim uses plug-in timers to automate his indoor plant lighting. Each timer has a plug on the back, a socket on the front, and a motorised dial that rotates once for every 24 hours that the plug has power.

小蒂用插電式定時器來實現室內植物補光燈自動化。每個定時器的背面都有插頭，正面有插座，附帶一個電動錶盤。定時器插電後，電動錶盤每 24 小時轉一圈。



When the time on the dial is between 9:00 and 17:00, the timer switch is on, so that any power on the plug is switched through to the socket.

當錶盤上的時間介於 9:00 到 17:00 之間時，定時器開啟，插電後為前方插座供電。

For fun, he plugs together three of his timers, all set to time 0:00, with a lamp plugged into the front socket. How many hours until the lamp turns on?

小蒂做了一個有趣的實驗。他將 3 個時間設置為 0:00 的定時器串聯起來，並將一盞臺燈插入到定時器前方插座。請問需要幾小時才能點亮這盞臺燈？