



# MathConceptition

## 2023

# P3

# Question Booklet

# 問題簿

**Time: 50 Minutes**

**Calculators are NOT permitted.**

---

**Instructions:**

1. **DO NOT OPEN THIS QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.**
2. **If the information printed on your answer sheet is not correct, please inform the invigilator immediately.**
3. **Please use a pencil and write your answers neatly ONLY on the answer sheet provided. DO NOT write or draw in the circle next to each answer box. No mark will be given if you failed to follow this instruction.**
4. **Unless otherwise specified, all answers must be in exact value and in its simplest form. Writing the units for the answers is NOT necessary.**
5. **Rough-work sheets provided will be collected at the end of the contest but they will not be marked.**
6. **Diagrams in this question booklet are not necessarily drawn to scale.**

**限時：50 分鐘**

**不允許使用計算機。**

---

**比賽須知：**

1. **未宣布開始前，切勿翻閱此問題簿。**
2. **請核對答題紙上列出的資料是否與你相符。如有問題，請舉手。**
3. **所有答案必須寫在答題紙內，並須用鉛筆作答。請勿填寫或畫花題號後方的圓圈，否則該題答案將會作廢。**
4. **除非題目特別表明，所有答案均不需填寫單位，但必須以準確數值及最簡方式表示。**
5. **比賽完結時監考員會收回桌上的草稿紙，但草稿紙上所書寫的任何文字或圖表將不獲評閱。**
6. **此問題簿的附圖不一定依比例繪成。**

- 1)  $55 + 66 = ?$  [1%]
- 2)  $345 + 599 = ?$  [1%]
- 3)  $131 - 59 = ?$  [1%]
- 4)  $821 - 532 = ?$  [1%]
- 5)  $34 \times 8 = ?$  [1%]
- 6)  $987 \div 3 = ?$  [1%]
- 7)  $25 + 8 \times 15 = ?$  [1%]
- 8)  $75 + 17 + 17 + 17 + 17 + 17 = ?$  [1%]
- 9)  $745 - 953 + 500 = ?$  [1%]
- 10)  $49 \times (5 + 7) = ?$  [1%]
- 11)  $(34 + 5) \times (66 - 46) = ?$  [1%]
- 12)  $24 + 6 \times 6 + 22 - 2 \times 2 = ?$  [1%]
- 13)  $2023 - 1788 + 177 + 1988 = ?$  [1%]
- 14)  $6 \times 31 - 53 \times 3 + 8 \times 61 = ?$  [1%]
- 15)  $1 + 11 + 2 + 12 + 3 + 13 + \cdots + 10 + 20 = ?$  [1%]

- 16) A stationery store has 322 coloured pencils, half of them are red. A staff packs the other half of the coloured pencils into boxes of 7. At most how many boxes of coloured pencils are there? [2%]

文具店有 322 枝顏色筆，其中一半是紅色。店員把另一半的顏色筆每 7 枝包裝成一盒。最多可包裝成顏色筆多少盒？

- 
- 17) Form the largest 5-digit even number using the number cards below. [2.1%]

用以下的數字組成一個最大的五位雙數。



- 18) A pair of jeans costs \$227. On Saturdays, you can buy 4 pairs of jeans for a discounted price of \$887. [2.2%]

In other words, \$ \_\_\_\_?\_\_\_\_ can be saved if one buys 4 pairs of jeans on Saturday.

牛仔褲每條原價 227 元。每逢星期六可以優惠價 887 元購買 4 條牛仔褲。

換言之，在星期六買 4 條牛仔褲可節省 \_\_\_\_?\_\_\_\_ 元。

- 
- 19)  $17\text{ m} + 560\text{ cm} + 1\text{ mm} = \underline{\hspace{1cm}}? \hspace{1cm}\text{mm}$  [2.3%]

17 米 + 560 厘米 + 1 毫米 =           ?           毫米

- 20) Alex is 153 cm tall, Bill is 110 mm taller than Charles, and Charles is 340 mm shorter than Alex. [2.4%]

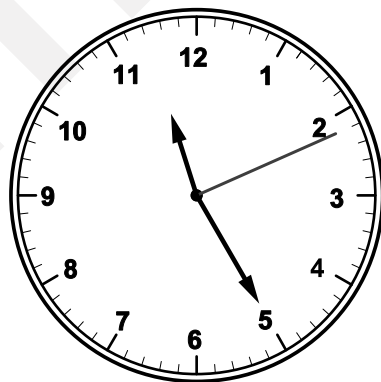
The sum of Alex's and Bill's heights is \_\_\_\_\_?\_\_\_\_\_ cm.

小明身高 153 cm，小吉比小友高 110 mm，小友又比小明矮 340 mm。

小明和小吉的身高之和是 \_\_\_\_\_?\_\_\_\_\_ cm。

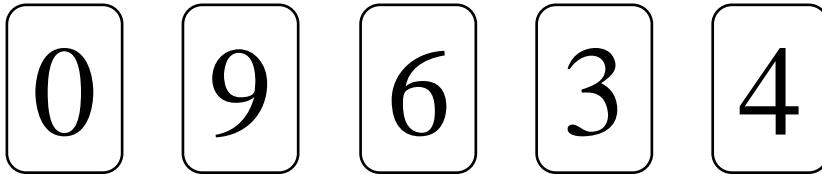
- 
- 21) It is now at night, the clock below shows the current time. After how many seconds will the next day begin? [2.5%]

現在是晚上，下圖的時鐘顯示了現在的時間。距離下一天的開始還有多少秒？



- 22) Form the 5-digit number that is closest to 40000 using the number cards below. [2.6%]

用以下的數字組成一個最接近 40000 的五位數。



- 
- 23) There is a quadrilateral with a pair of opposite sides that are different in length. If one draws a straight line connecting these two sides, and the line makes a right angle with one of the sides, then the line would also make a right angle on the other end. The other two sides of this quadrilateral are also different in length. What type of quadrilateral is it? [2.7%]

有一個四邊形，它有一對長度不一的對邊。把這對對邊以一條直線連接，若線的其中一端形成直角，線的另一端也會形成直角。這四邊形的另外兩條邊的長度也不一。它是哪種類型的四邊形？

- 24) There are 278 students waiting for maps. They are separated in groups of 23. However, the first group is combined with the group that has fewer than 23 students. [2.8%]

There are \_\_\_\_?\_\_\_\_ groups of 23 students.

有 278 名學生在等待派發地圖。學生被分成每 23 人一組。第一組會和不足 23 人一組的學生合併。  
共有 23 人的小組有 \_\_\_\_?\_\_\_\_ 個。

- 
- 25) Sherry has 45 fewer coloured pencils than Lily. Lily has 6 times as many coloured pencils as Sherry. How many coloured pencils does Lily have? [2.9%]

香香有的顏色筆比莉莉少 45 枝，莉莉有的顏色筆是香香的 6 倍。莉莉有顏色筆多少枝？

- 26) My sister is 20 years old, my brother is 10 years younger than her. [3%]  
10 years ago, my father's age was 3 more than 4 times my sister's age. How old is my father now?

姐姐今年 20 歲，弟弟比姐姐小 10 歲。10 年前，爸爸的歲數比姐姐的歲數的 4 倍多 3。爸爸現在多少歲？

- 
- 27) Alan took a 3-hour and 48-minute flight to Japan from Hong Kong. [3.1%]  
His arrival time is 12:21 a.m. in Japan. Japan is one hour ahead of Hong Kong. What time was it in Hong Kong when Alan's flight took off? (Answer in 24-hour time.)

小明由香港坐了 3 小時 48 分鐘飛機到日本。他到達日本時是日本時間早上 12:21。日本時間比香港時間快一小時。求小明的飛機起飛時的香港時間。(以 24 小時時制作答。)

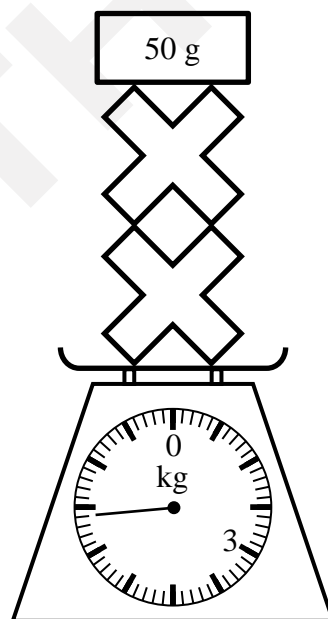


- 28) A 60-minute exam has three parts. Peter spent one-third of the time to finish the first part, he then spent half of the exam time to finish the second part, and then spent 5 minutes to complete the last part. How many minutes did Peter use to complete the whole exam? [3.2%]

一個 60 分鐘的考試有 3 個部分。得得用了三分之一的考試時間完成第一部分，再用了考試時間的一半完成第二部分，之後用了 5 分鐘完成最後的部分。得得完成整個考試共用了多少分鐘？

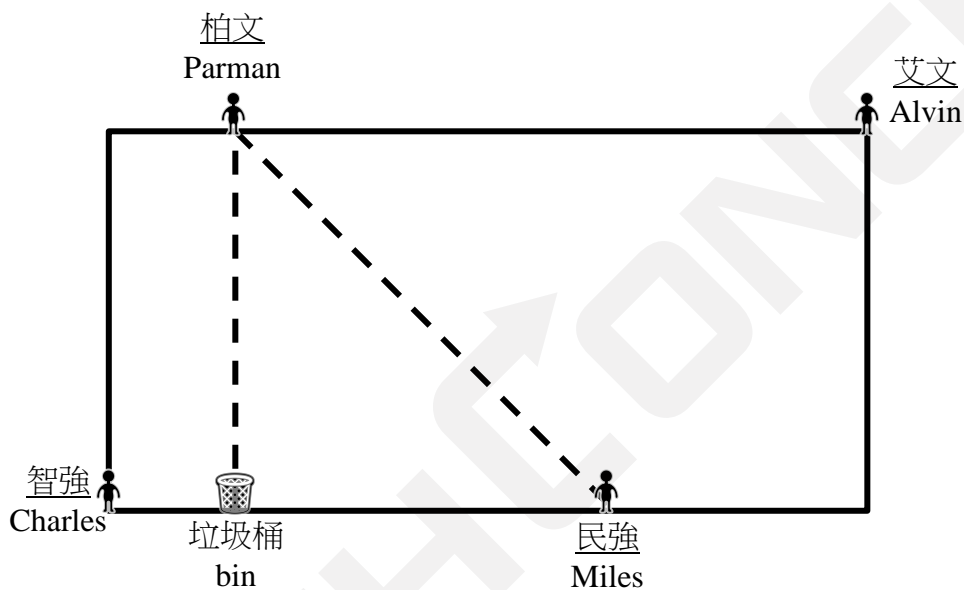
- 29) Observe the figure below, how many grams does one ☒ weigh? [3.3%]

觀察下圖，一個 ☒ 重多少克？



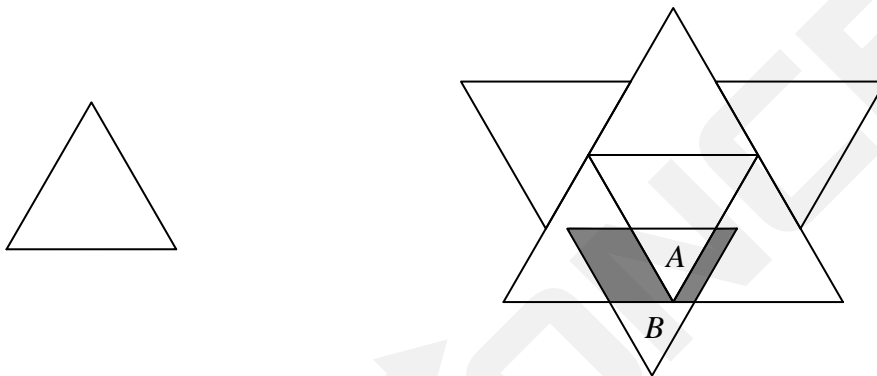
- 30) The figure below shows a rectangular park. Parman is 10 m away from Alvin. Charles is 8 m away from Miles. The positions of Parman, the bin and Miles make an isosceles right-angled triangle. Parman runs along the 4 sides of the park once, how many meters does Parman run? [3.4%]

下圖是一個長方形的公園。柏文距離艾文 10 米。智強距離民強 8 米。柏文、垃圾桶和民強的位置形成了一個等腰直角三角形。柏文沿著公園四邊跑了一圈，柏文跑了多少米？



- 31) The figure on the right is formed by combining 7 of the same equilateral triangles on the left. Triangle *A* and triangle *B* are the same in shape and size. Express the shaded part as a fraction of the whole figure on the right. [4%]

右圖是由 7 個與左圖相同的等邊三角形組成的。三角形 *A* 和三角形 *B* 的形狀和大小都相同。陰影部分佔整個右圖的幾分之幾？



- 32) 4 oranges and 4 apples cost a total of \$84. [4.1%]  
 3 oranges and 2 apples cost \$48.  
 3 oranges cost \$ \_\_\_\_?\_\_\_\_ .  
 4 個橙和 4 個蘋果共售 84 元。  
 3 個橙和 2 個蘋果共售 48 元。  
 3 個橙共售 \_\_\_\_?\_\_\_\_ 元。

- 33) There are 4 different spices. A chef might use them in combinations of 2, 3 or all 4 of them in cooking. How many possible combinations are there in total? [4.2%]

現有 4 種調味料。廚師在烹飪時會使用 2 種、3 種或全部 4 種調味料。共有組合多少種？

- 34) 5 students are playing a party game where they role-play as honest civilians and demons who always lie. Who is (are) role-playing as civilian(s)? [4.3%]

5 個學生在玩一個派對遊戲，他們扮演誠實的平民和總是說謊的惡魔。誰在扮演平民？

Student *A* said '*B* is not a civilian.'

Student *B* said '*E* is not a civilian.'

Student *C* said '*A* is not a demon.'

Student *D* said '*A* and *C* are not the same.'

Student *E* said '*D* is a demon.'

學生 *A* 說：「*B* 不是平民。」

學生 *B* 說：「*E* 不是平民。」

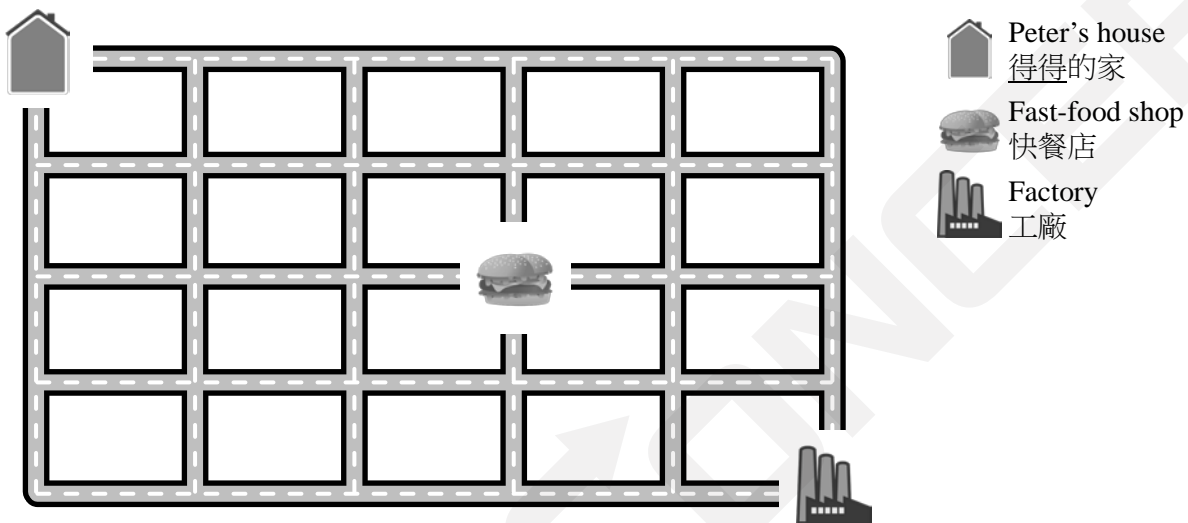
學生 *C* 說：「*A* 不是惡魔。」

學生 *D* 說：「*A* 和 *C* 是不同的。」

學生 *E* 說：「*D* 是惡魔。」

- 35) Peter takes a taxi from his house to the factory. He needs to stop by the fast-food shop to get breakfast. Assuming that the taxi takes the shortest routes, find the number of possible routes the taxi can take. [4.4%]

得得乘的士從家到工廠。他途中必須路經快餐店買早餐。假設的士經最短路線行走。總共有多少條不同的路線？



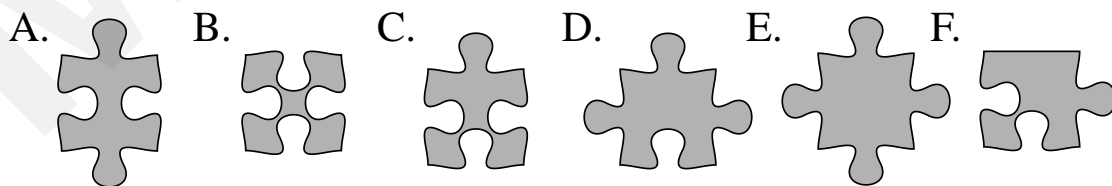
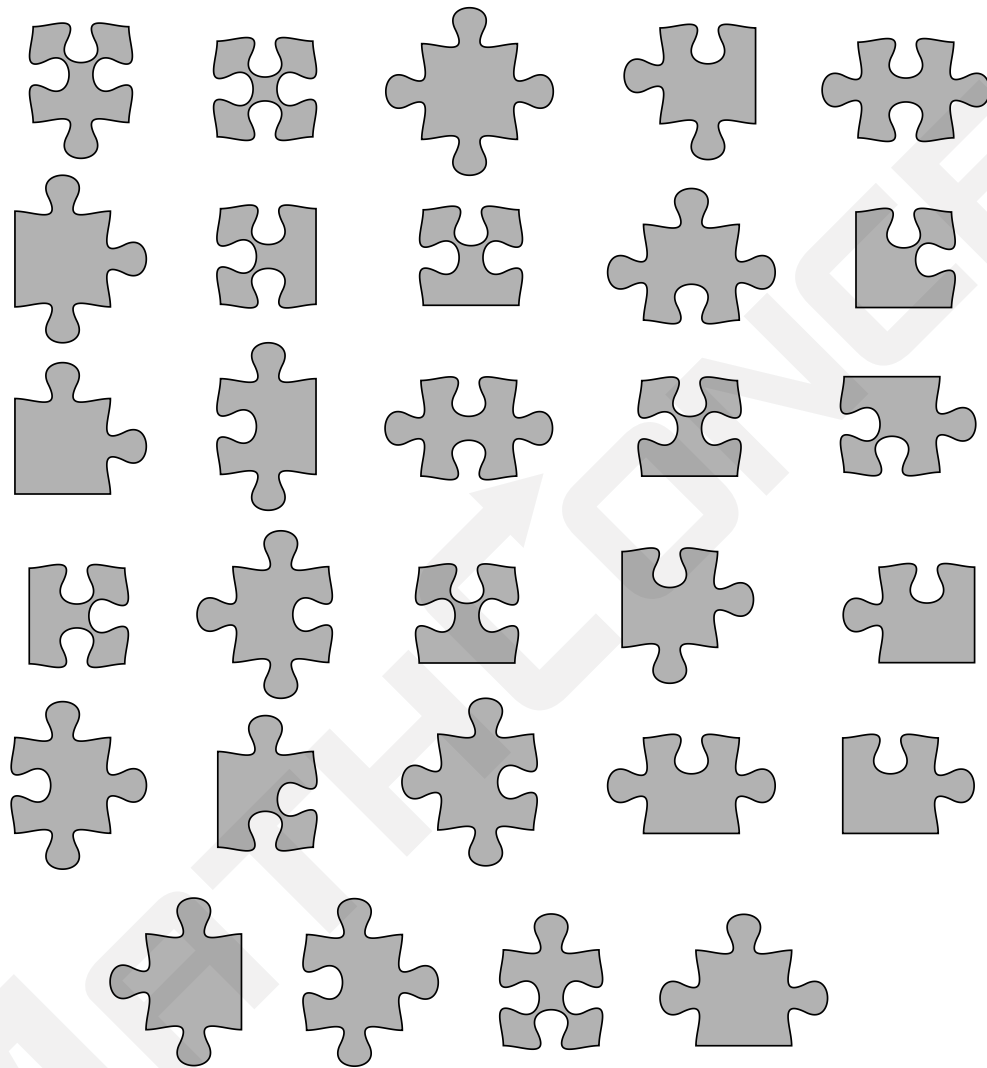
- 36) A mask making factory received an order. 3 identical machines completed one-third of the order in 14 minutes. However, one of the machines stops working. How many more minutes will the factory need to complete the whole order? [4.5%]

口罩廠接了一張製造口罩的訂單。3 部完全相同的口罩機用了 14 分鐘完成了訂單的三分之一。現在其中一部口罩機故障了。還需要多少分鐘才能完成整個訂單？

- 37) A 30-piece jigsaw puzzle has 5 columns and 6 rows. One of the pieces is missing. Below are the remaining 29 pieces. Which is the missing piece?

[4.6%]

一個共 30 塊的拼圖有 6 行，每行有 5 塊。現在拼圖的其中一塊不見了。以下是剩下的 29 塊。哪一塊是不見了的拼圖？



- 38) There are 97 red pens, 71 blue pens, 61 green pens and 83 yellow pens in a cardboard box. If one draws pens from the box without looking, find the least number of pens needed to be drawn so that one can always get at least 7 pairs of same-coloured pens. [4.7%]  
(The pens in a pair must be of the same colour but the colour does not have to be the same across pairs. Each pair is considered separately, a pen cannot be shared across pairs.)

現有 97 枝紅色筆、71 枝藍色筆、61 枝綠色筆和 83 枝黃色筆在一個紙箱裏。若不看著紙箱並從裏面取出筆，需要取出最少多少枝筆才能保證至少有 7 對相同顏色的筆？  
(每對之中的筆顏色一樣，但每對筆之間的顏色不需一樣。每一對都是單獨的，同一枝筆不能跨對。)

- 39) Define ' $\bowtie$ ': [4.8%]  
定義「 $\bowtie$ 」:

(a)  $a \leq b, a \bowtie b = 3b - 2a$

(b)  $a > b, a \bowtie b = 3a + 4b$

Given that  $8 \bowtie p = p \bowtie 8$  and  $p$  is a positive whole number. Find the value of  $p$ .

已知  $8 \bowtie p = p \bowtie 8$  及  $p$  是個正整數。求  $p$  的值。

40) How many rectangles are there in the figure that do not contain ♡? [4.9%]

圖中不包含 ♡ 的長方形有多少個？

	♡	
		♡

End of paper  
全卷完





ANSWER SHEET

REG NO			P3
NAME			
GRADE			
SEAT			

☐ IDCHECK

☐ ABSENT

ANSWER		ANSWER		ANSWER		ANSWER					
1	121	<input type="radio"/>	11	780	<input type="radio"/>	21	2089	<input type="radio"/>	31	$\frac{2}{25}$	<input type="radio"/>
2	944	<input type="radio"/>	12	78	<input type="radio"/>	22	39640	<input type="radio"/>	32	18	<input type="radio"/>
3	72	<input type="radio"/>	13	2400	<input type="radio"/>	23	Trapezium Trapezoid 梯形	<input type="radio"/>	33	11	<input type="radio"/>
4	289	<input type="radio"/>	14	515	<input type="radio"/>	24	11	<input type="radio"/>	34	A, C, E	<input type="radio"/>
5	272	<input type="radio"/>	15	210	<input type="radio"/>	25	54	<input type="radio"/>	35	60	<input type="radio"/>
6	329	<input type="radio"/>	16	23	<input type="radio"/>	26	53	<input type="radio"/>	36	42	<input type="radio"/>
7	145	<input type="radio"/>	17	98554	<input type="radio"/>	27	19:33	<input type="radio"/>	37	C	<input type="radio"/>
8	160	<input type="radio"/>	18	21	<input type="radio"/>	28	55	<input type="radio"/>	38	17	<input type="radio"/>
9	292	<input type="radio"/>	19	22601	<input type="radio"/>	29	3275	<input type="radio"/>	39	8	<input type="radio"/>
10	588	<input type="radio"/>	20	283	<input type="radio"/>	30	36	<input type="radio"/>	40	42	<input type="radio"/>

