MathConceptition

2022

P6

Question Booklet

問題簿

Name:
姓名：

Reg. No.:
登記編號：

Time: 50 Minutes
Calculators are NOT permitted.

Instructions:

1. **DO NOT OPEN THIS QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.**
2. **Write your name and registration number on the cover of this question booklet.**
3. **If the information printed on your answer sheet is not correct, please inform the invigilator immediately.**
4. **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.**
5. **Unless otherwise specified, all answers must be in exact value and in its simplest form. Writing the units for the answers is NOT necessary.**
6. **Rough-work sheets provided will be collected at the end of the contest but they will not be marked.**
7. **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. 請在此問題簿封面的適當位置寫上你的姓名及登記編號。

3. 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。

4. 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。

5. 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。

6. 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。

7. 此問題簿的附圖不一定依比例繪成。

For question 1 to 10, the answers must be expressed in integer or decimal.

由第 1 至 10 題，答案必須以整數或小數表示。

1) $56.23 + 8.9 = ?$ [1%]

2) $64.2 - 6.42 = ?$ [1%]

3) $34 \times 2.5 = ?$ [1%]

4) $2350 \times 0.01 = ?$ [1%]

5) $4.25 \times 9.2 = ?$ [1%]

6) $43 \times 0.5 = ?$ [1%]

7) $47.2 \div 2.5 = ?$ [1%]

8) $64 \times 15 \div 30 = ?$ [1%]

9) $24 \div 25\% = ?$ [1%]

10) $96.2 + 3.2 \div 0.16 = ?$ [1%]

For questions 11 to 15, the answers must be expressed in proper fraction, integer or mixed number.

由第 **11** 至 **15** 題，答案必須以真分數、整數或帶分數表示。

11) Evaluate $3 + \dfrac{1}{6} - \dfrac{9}{8}$.

計算 $3 + \dfrac{1}{6} - \dfrac{9}{8}$ 。

[1%]

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12) Evaluate $54\% + 21\% - \dfrac{1}{2}$.

計算 $54\% + 21\% - \dfrac{1}{2}$ 。

[1%]

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13) Evaluate $1 - \dfrac{1}{5} - \dfrac{1}{15} - \dfrac{1}{25} + \dfrac{1}{5}$.

計算 $1 - \dfrac{1}{5} - \dfrac{1}{15} - \dfrac{1}{25} + \dfrac{1}{5}$ 。

[1%]

14) Evaluate $42 \div \dfrac{2}{5} \times 0.3 \div \dfrac{3}{5}$. [1%]

計算 $42 \div \dfrac{2}{5} \times 0.3 \div \dfrac{3}{5}$ 。

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15) Evaluate $70\% \div \left(\dfrac{3}{5} + \dfrac{3}{15} \right)$. [1%]

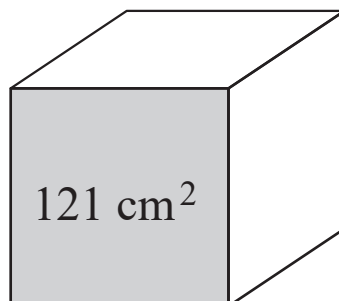計算 $70\% \div \left(\dfrac{3}{5} + \dfrac{3}{15} \right)$ 。

16) Walking from sports ground to school, Olivia spent 84 minutes, Mia spent 4501 seconds, and Isabella spent 1 hour. Whose speed was the fastest? [2.0%]

從運動場走到學校，小芳花了 84 分鐘，小婷花了 4501 秒，小歐花了 1 小時。誰的速率最快？

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17) The area of the front side of the cube is 121 cm^2. When the cube below is cut into a net, what is the area of the net in cm^2? [2.1%]

下圖正方體的正面面積是 121 平方厘米。把正方體剪成一個摺紙圖樣後，該摺紙圖樣的面積是多少平方厘米？

121 cm^2

18) There are 40 questions in a competition. James answered 75% correctly. How many questions did he answer wrongly? [2.2%]

比賽有 40 題問題，小明答對了 75%，他答錯了多少題？

19) The price of lemon is $44/kg and the price of blueberry is $75/0.5 kg. Mum bought 2.3 kg of lemon and 0.3 kg of blueberry. How much did she pay? [2.3%]

每公斤的檸檬售 44 元，每半公斤的藍莓售 75 元。媽媽買了 2.3 公斤的檸檬和 0.3 公斤的藍莓。她付了多少元？

20) Each cup of milk tea costs $15 and each mochi costs $8.50. Betty had $87.50 and she bought 2 cups of milk tea for her elder brother. At most how many mochi can she buy with the remaining money?　[2.4%]

奶茶每杯售 15 元，大福每個售 8.5 元。雅婷原有 87.5 元，她先買了兩杯奶茶給哥哥，餘下的錢最多可買大福多少個？

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21) A cuboid tank is 8 cm long, 12 cm wide and 15 cm tall. There is some water in the tank, and the water level is $\frac{3}{5}$ of its height. What is the volume of water in the tank in cm^3?　[2.5%]

一個長方體容器長 8 厘米，闊 12 厘米，高 15 厘米，裡面裝有一些水，而水位是容器高度的 $\frac{3}{5}$ 。容器內水的體積是多少立方厘米？

22) The average height of A, B, C, D and E is 128 cm. 2 people join the group and their average height is 163 cm. What is the average height of these 7 people in cm? [2.6%]
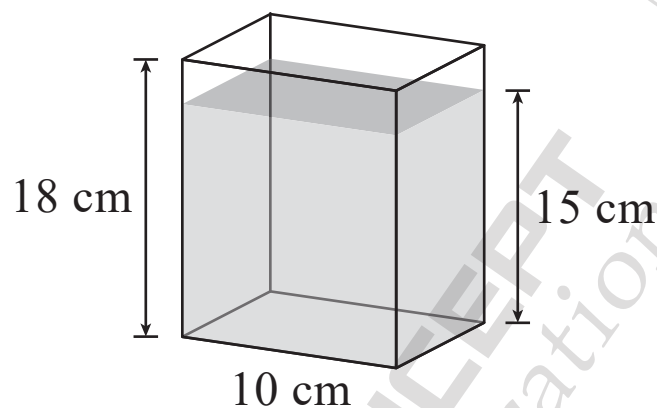
甲、乙、丙、丁和戊五人的平均身高是 128 厘米。有 2 人加入他們，而這 2 人的平均身高是 163 厘米，這 7 人的平均身高是多少厘米？

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23) This year, Mum is $\frac{4}{5}$ the age of Dad. Younger brother is 30 years younger than Mum, and elder brother is 4 years older than younger brother. If elder brother is now 6 years old, what is the age of Dad? [2.7%]

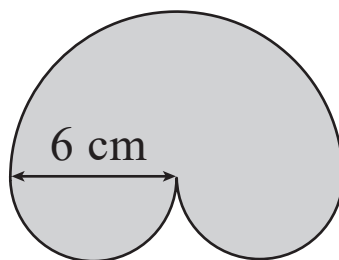今年，媽媽的歲數是爸爸的 $\frac{4}{5}$。弟弟比媽媽年輕 30 年，而哥哥比弟弟大 4 年。如果哥哥現在 6 歲，爸爸的歲數是甚麼？

24) When 0.87 L of water is poured into the tank, the water level will rise by 15 cm. Find the width of the tank in cm. [2.8%]
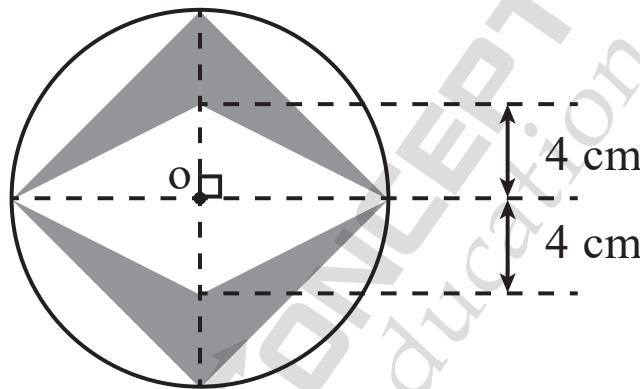
把 0.87 升的水倒入水族箱後，水位上升了 15 厘米。水族箱的闊度是多少厘米？

18 cm

15 cm

10 cm

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25) Find the perimeter of shaded region in cm. [2.9%]
(Take π = 3.14)

以厘米為單位，求著色圖形的周界。（取 π = 3.14）

6 cm

26) The circumference of the circle is $47\dfrac{1}{7}$ cm. Find the area of the shaded region in cm^2. (Take $\pi = \dfrac{22}{7}$)　　[3.0%]

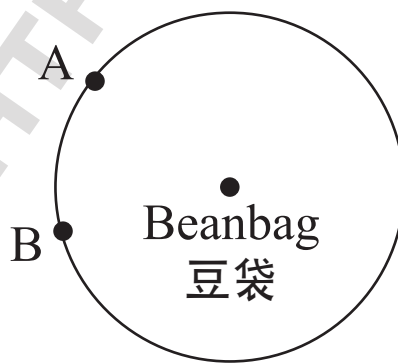圓的周界是 $47\dfrac{1}{7}$ 厘米。以平方厘米為單位，求著色部分的面積。（ 取 $\pi = \dfrac{22}{7}$ ）

27) There was a total of 250 red and blue pens in a school. 40% of the pens were red pens. After an activity, 20% of the red pens and 10% of the blue pens were used up and threw away. How many pens are left?　　[3.1%]

紅筆和藍筆原本合共有 250 支，紅筆佔全部的百分之四十。活動結束後，20% 的紅筆和 10% 的藍筆用完扔掉。餘下的筆共有多少支？

28) David and his dad join the family beanbag race. David has [3.2%] to run from point A to the center of the circular lawn to get the beanbags, and then give the beanbags to his father at point B. If the circumference of the lawn is 88 m, and the average running speed of David is 4 m/s, how many seconds will it take for David and his father to complete the race? (Take $\pi = \dfrac{22}{7}$)

浩銘和他爸爸參加了親子豆袋比賽。浩銘要由 A 點跑到圓形草地的中心點拿豆袋，再將豆袋交到站在 B 點的爸爸手上。如果草地的周界是 88 米，而浩銘的平均速率是每秒 4 米，浩銘和爸爸要多少秒才能完成賽事？（ 取 $\pi = \dfrac{22}{7}$ ）

29) 2 years ago, City A had x people. Last year, the population increased by 5% compared to 2 years ago, and then decreased by 5% in this year compared to last year. If the population of City A this year is 11970, find the value of x.   [3.3%]

甲城市兩年前原有 x 人。去年人口比兩年前增加了 5%，今年比去年減少了 5%。如果今年的城市人口是 11970，求 x 的值。

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30) Solve the equation $\dfrac{2x+4}{3} = x$.   [3.4%]

解方程 $\dfrac{2x+4}{3} = x$ 。

31) At least how many consecutive even numbers have to be chosen so that there must be at least one number that can be divisible by 9? [4.0%]

最少多少個連續偶數中，有至少一個數可以被 9 整除？

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32) What is the remainder when $42^{25} + 35^{183} - 12^3$ is divided by 10? [4.1%]

$42^{25} + 35^{183} - 12^3$ 除以 10 的餘數是甚麼？

33) Three bottles of solutions A, B and C are mixtures of alcohol and water. A weighs 250 g, of which 12% is alcohol; B weighs 300 g, of which x% is alcohol; C weighs 100 g, of which 50% is alcohol. Mixing all three bottles of solutions, the new mixture contains 40% of alcohol. What is the value of x? [4.2%]

有甲乙丙三瓶由酒精加水而成的酒精溶液。甲重 250 克，其中 12% 是酒精；乙重 300 克，其中 x% 是酒精；丙重 100 克，其中 50% 是酒精。將三瓶酒精溶液混合後，新溶液含有 40% 的酒精。x 的值是多少？

34) Given a certain number has three factors. If the sum of the number and twice that number is equal to 8427, find the sum of all factors of that number. [4.3%]

已知某數有三個因數。若該數與該數的兩倍之和等於 8427，求該數的因數之和。

35) Each sheep consumes water in a lake at a constant rate [4.4%] while the water in the lake increases at a constant rate every day as it rains every day. If 16 sheep consume the whole lake in 8 days and 28 sheep consume the whole lake in 4 days. How many sheep would be needed to consume the whole lake in 16 days?

每隻羊每天會到湖裡喝一定份量的水，而那個地方每天都會下一定份量的雨，所以每天湖裡的水都會增加一定份量。16 隻羊喝 8 天便喝完湖裡的水，28 隻羊喝 4 天便喝完湖裡的水。多少隻羊喝 16 天會喝完湖裡的水？

36) When the sum of digits of month and days is 13, this [4.5%] day is a "Lucky Day". For example, 28th March means "$2+8+3=13$" and 28th December means "$2+8+1+2=13$", thus they are both "Lucky Days". How many "Lucky Days" are there between 1st January 2020 and 31st December 2030?

若月份和日子的位數之和是 13，則這天是「吉日」。例如，3 月 28 日即「3 + 2 + 8 = 13」；12 月 28 日即「1 + 2 + 2 + 8 = 13」，所以這兩天都是「吉日」。2020 年 1 月 1 日至 2030 年 12 月 31 日之間有多少個「吉日」？

37) There is a job. It takes 12 days, 18 days and 10 days for A, [4.6%]
B and C to complete the job alone respectively. If A and C
work together for 3 days, and then B completes the
remaining parts alone, how many minutes do A, B and C
take to complete the whole job this time?

一份工作，甲、乙、丙單獨完成分別需要 12 天、 18
天、10 天。甲和丙合作工作了 3 天，餘下工作再由
乙獨自完成。甲、乙和丙這次完成工作共花了多少
分鐘？

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38) Find the value of $\dfrac{120}{3} - \dfrac{120}{9} + \dfrac{120}{27} - \dfrac{120}{81} + \ldots$. [4.7%]

求 $\dfrac{120}{3} - \dfrac{120}{9} + \dfrac{120}{27} - \dfrac{120}{81} + \ldots$ 的值。

39)	Solve $(x - 100)(x - 92) - (x - 100)(x - 97) = 10.$	[4.8%]

解方程 $(x - 100)(x - 92) - (x - 100)(x - 97) = 10$。

40)	When a number is divided by 2, 3 and 11, the remainders are 1, 2 and 4 respectively. And the number is divisible by 17. Given that it is a three-digits number, find the smallest possible value of that number.	[4.9%]

某數除以 2 的餘數是 1、除以 3 的餘數是 2、除以 11 的餘數是 4，且可以被 17 整除。已知該數是個三位數，求該數的最小可能值。

End of paper
全卷完

MATH 數學・思維大激鬥
CONCEPTION

ANSWER SHEET

REG NO	
NAME	
GROUP	
SEAT	

P6

	ANSWER			ANSWER			ANSWER			ANSWER	
1	65.13	◯	11	$2\frac{1}{24}$	◯	21	864	◯	31	9	◯
2	57.78	◯	12	$\frac{1}{4}$	◯	22	138	◯	32	9	◯
3	85	◯	13	$\frac{67}{75}$	◯	23	40	◯	33	60	◯
4	23.5	◯	14	$52\frac{1}{2}$	◯	24	5.8	◯	34	2863	◯
5	39.1	◯	15	$\frac{7}{8}$	◯	25	37.68	◯	35	10	◯
6	21.5	◯	16	Isabella 小歐	◯	26	52.5	◯	36	256	◯
7	18.88	◯	17	726	◯	27	215	◯	37	15984	◯
8	32	◯	18	10	◯	28	7	◯	38	30	◯
9	96	◯	19	($)146.2(0)	◯	29	12000	◯	39	102	◯
10	116.2	◯	20	6	◯	30	4	◯	40	323	◯

①②④⑧