



MathConceptition

2024

P6

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。**

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) $15.9 + 14.7 = ?$ [1%]

2) $74.5 - 16.8 = ?$ [1%]

3) $68.3 - 8.83 = ?$ [1%]

4) $32.8 \times 6.5 = ?$ [1%]

5) $\frac{3}{5} \times 8\frac{1}{3} = ?$ [1%]

6) $64 \div 5 = ?$ [1%]

7) $0.684 \div 2.4 = ?$ [1%]

8) $2870 \times 0.0001 = ?$ [1%]

9) $(37.2 - 5.2) \times 0.01 = ?$ [1%]

10) $14 \times 2.65 \times 20\% = ?$ [1%]

For question 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 $1 - \frac{1}{8} - \frac{3}{8} + \frac{7}{16}$.

計算 $1 - \frac{1}{8} - \frac{3}{8} + \frac{7}{16}$ 。

[1%]

12) Evaluate $4\frac{5}{6} - \left(3\frac{1}{3} - 1\frac{2}{3}\right)$.

計算 $4\frac{5}{6} - \left(3\frac{1}{3} - 1\frac{2}{3}\right)$ 。

[1%]

13) Evaluate $1\frac{1}{6} \times 45\%$.

計算 $1\frac{1}{6} \times 45\%$ 。

[1%]

14) Evaluate $\frac{3}{8} \times (1 - 40\%) + \frac{5}{8}$.

計算 $\frac{3}{8} \times (1 - 40\%) + \frac{5}{8}$ 。

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15) Evaluate $28 \times \frac{3}{4} \div 0.3 - 25.5$.

計算 $28 \times \frac{3}{4} \div 0.3 - 25.5$ 。

[1%]

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- 16) Which of the following numbers is greater than 0.1? [2%]

在下列各數中，哪個數比 0.1 大？

- A. 0.05 B. $\frac{3}{11}$ C. $\frac{1}{16}$
D. 3.2% E. 0.56%

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-
- 17) According to the information given, write an algebraic expression for the answer. [2.1%]

Thomson has y candies. He eats 5 of them, and gives half of the remaining candies to Jenny. Jenny gets _____?_____ candies.

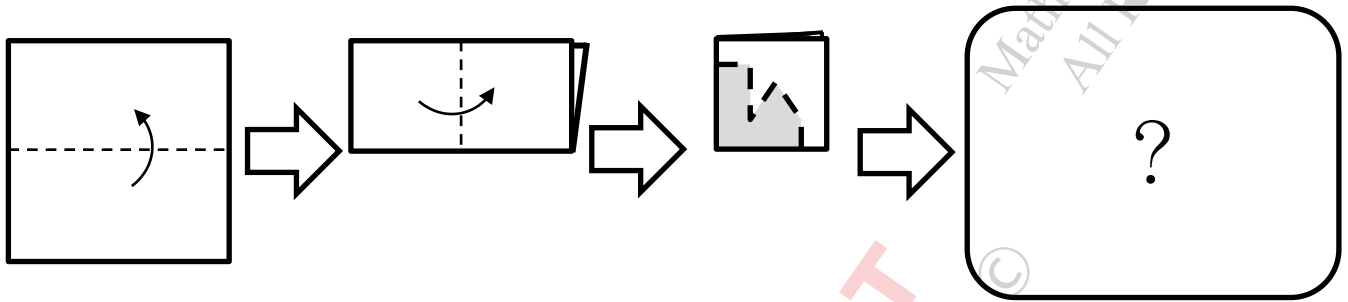
根據題意，列寫代數式作答。

大偉有糖果 y 顆。他吃掉 5 顆後，再把餘下的一半分給梓晴。梓晴可得糖果 _____?_____ 顆。

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- 18) A square paper is folded into half twice and cut along the dotted lines as shown below. Which of the following shapes is formed? [2.2%]

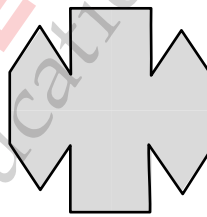
把正方形手工紙如下圖對摺 2 次後，沿著虛線剪出圖形。以下哪一個是剪出來的圖形？



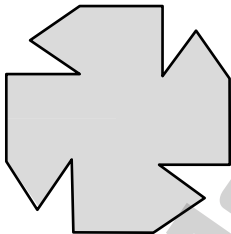
A.



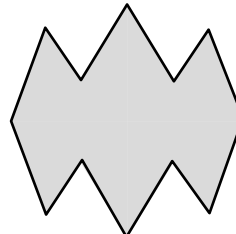
B.



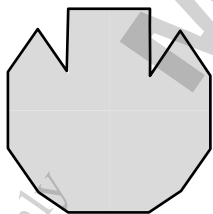
C.



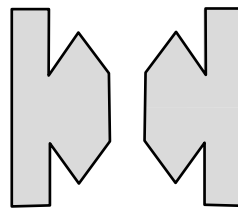
D.



E.



F.



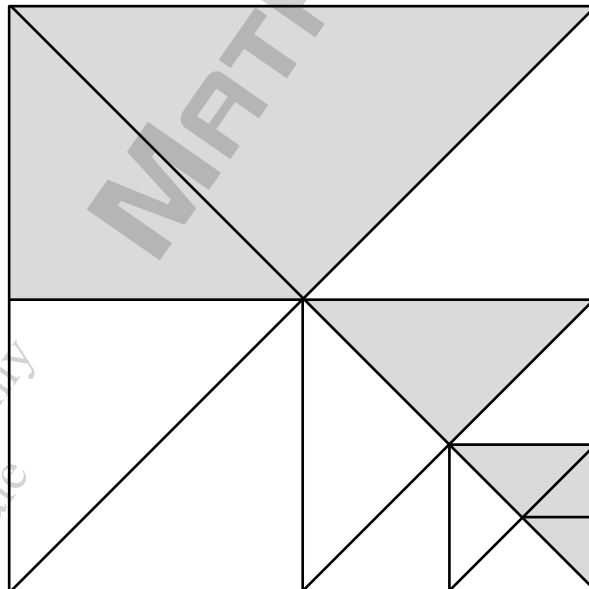
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- 19) There are 4 students and their average weight is 56 kg. After 6 students join the group, the new average weight of the group increases by 5%. What is the total weight of the 6 newly joined students in kg? [2.3%]

四名學生的平均體重為 56 公斤。其後，有六名學生加入該組，使得該組的平均體重增加了 5%。這六名新加入的學生的總體重是多少公斤？

- 20) ? % of the following figure is shaded. [2.4%]
(Correct your answer to 1 decimal place.)

下圖的陰影部份佔總面積的 ? %。(答案取至一位小數。)



- 21) The school has 640 students. $\frac{1}{4}$ of the students are boys and 15% of [2.5%]
the boys wear glasses. If none of the girls wears glasses, how many
students do not wear glasses?

學校內有 640 名學生，其中 $\frac{1}{4}$ 是男生，15% 的男生都配戴眼鏡。
若女生都不配戴眼鏡，學校內共有多少名學生是不配戴眼鏡的？

-
- 22) 630 grams of flour are packed into bags of 18.2 grams. At most y [2.6%]
bags can be packed, and there are z grams of flour remaining. Find
the value of $y + z$.

把 630 克面粉每 18.2 克包裝成一袋。最多共可包裝成 y 袋，餘
下面粉 z 克。求 $y + z$ 的值。

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- 23) There were 800 bacteria in a petri dish in the laboratory. The bacterial population grows at a speed of 35% per hour. After 2 hours, the teacher adds some antibiotics in the petri dish, so that the antibiotics reduce the number of bacteria to 486 in an hour. [2.7%]
___?___ % of the number of bacteria right before using antibiotics is the number of bacteria an hour after using antibiotics.

實驗室內的培養皿原有細菌 800 粒。細菌數量以每小時 35% 的速率增長。2 小時後，老師在培養皿內加入抗生素，使細菌數量於一小時後減至 486 粒。使用抗生素後一小時的細菌數量是剛使用抗生素前的細菌數量的 ___?___ %。

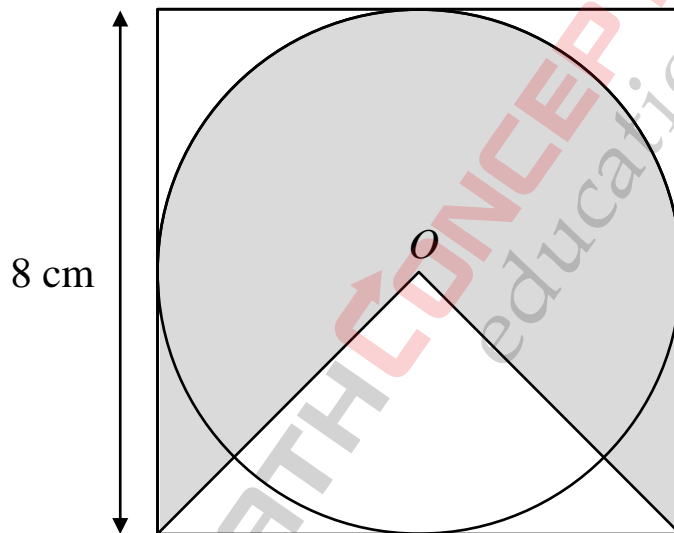
-
- 24) A cuboid fish tank with base area 480 cm^2 has a capacity of 8928 cm^3 . Mum fills the fish tank with some water, and puts 16 identical cubes of side length 6 cm inside so that the cubes are fully submerged in water. The water in the tank does not overflow. What is the rise in water level in cm? [2.8%]

長方體魚缸的容量是 8928 cm^3 ，其底面積為 480 cm^2 。媽媽把一些水注入魚缸，再把 16 個邊長為 6 cm 的正方體完全浸入水中，水並沒有溢出。魚缸內的水位上升了多少 cm？

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- 25) The figure below is formed by a circle, a square and a triangle overlapping each other. The circle is the largest circle in the square where O is the centre of the circle. Find the area of the shaded part in cm^2 . (Take $\pi = 3.14$) [2.9%]

以下圖形由圓、正方形及三角形重疊而成，該圓是正方形內最大的圓，且 O 是圓心。陰影部分的面積是多少平方厘米？
(取 $\pi = 3.14$)



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- 26) Given that the two figures below have the same area. [3%]
 A circle of radius 70 mm is cut from the trapezium to form Figure A. Figure B is a parallelogram. What is the upper base of the trapezium in centimetre? (Take $\pi = \frac{22}{7}$)

已知以下兩個圖形的面積是相等的。圖形 A 是由梯形剪去半徑為 70 毫米的圓後組成。圖形 B 是一個平行四邊形。梯形的上底是多少厘米？（取 $\pi = \frac{22}{7}$ ）

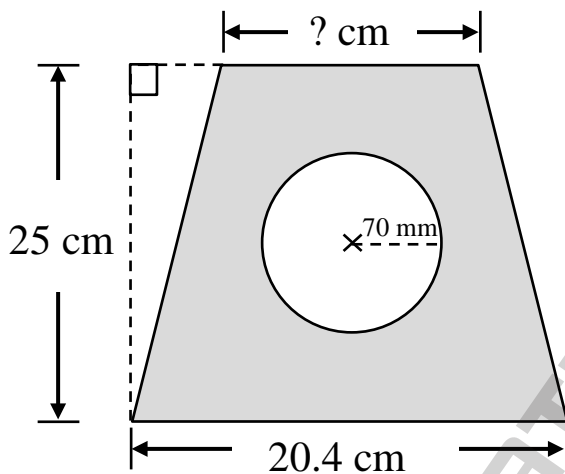


Figure A
圖形 A

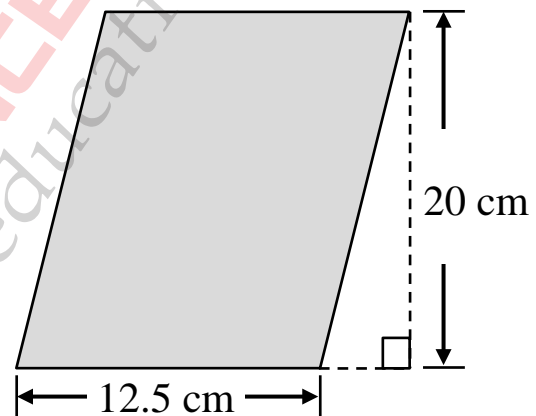
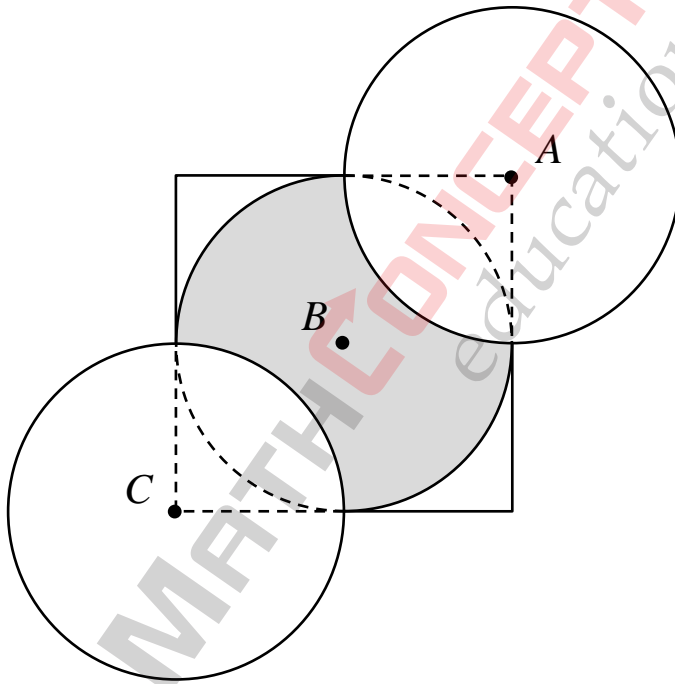


Figure B
圖形 B

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- 27) The figure below is formed by overlapping 3 identical circles and a square, where A , B and C are the centres of the circles, and the circle in the middle is the largest circle in the square. If the perimeter of the shaded part is 119.32 m, find the area of the shaded part in m^2 . (Take $\pi = 3.14$) [3.1%]

以下的圖形由三個大小相同的圓及一個正方形重疊而成，其中 A 、 B 和 C 分別是三個圓的圓心，且中間的圓是正方形內最大的圓。若陰影部分的周界是 119.32 米，陰影部分的面積是多少平方米？（取 $\pi = 3.14$ ）



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- 28) There is an empty cuboid tank that is 90 cm by 34 cm by 17 cm. [3.2%]
The tank is being filled with water from a tap at a speed of 1530 mL per minute. How many seconds does it need to fill up the tank without overflowing?

有一個空的長方體水箱，其尺寸是 $90\text{ cm} \times 34\text{ cm} \times 17\text{ cm}$ 。水箱現以每分鐘 1530 mL 的速率注水。需要多少秒才能把水箱注滿水且水不會溢出？

-
- 29) There is a 2-digit number \overline{ab} . If the units digit and the tens digit of that number are interchanged, the value of the new number is 36 greater than the original value. Find the sum of all possible values of \overline{ab} . [3.3%]

有一個兩位數 \overline{ab} 。當該數的個位和十位對調時，新的數值比原值大 36。求 \overline{ab} 的所有可能值之和。

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30) Given $\frac{45\%}{5} = \frac{2(x-3)}{4}$ and $\frac{3}{y-5} = \frac{6}{7} \times (x-0.38)$. [3.4%]

Find the value of y .

已知 $\frac{45\%}{5} = \frac{2(x-3)}{4}$ 及 $\frac{3}{y-5} = \frac{6}{7} \times (x-0.38)$ 。求 y 的值。

- 31) Samuel drives from City A to City B at a speed of 30 km/h. Upon reaching City B, he immediately realizes he left an important document behind in City A. He drives back the same route at a speed of 70 km/h to City A. What is the average driving speed of Samuel's entire journey in km/h? [4%]

俊軒以 30 公里每小時的速率由 A 城駕車至 B 城。當他到達 B 城時，立即發現自己遺留了重要文件在 A 城，然後以 70 公里每小時的速率沿路折返。俊軒整個路程的平均速率是多少公里每小時？

- 32) 15 students join a test where the full mark of the test is 100. The marks of students are ranked from the lowest score to the highest score. The average scores of all 15 students, first 10 students and the last 10 students are 51.8, 34.4 and 68.1 respectively. What is the average score of students ranking 6th to 10th? [4.1%]

現有 15 名學生參加一個測驗，該測驗的滿分是 100。測驗結束後，他們的分數由低至高排列。該 15 名學生、頭 10 名學生以及排名最後的 10 名學生的平均分數分別是 51.8、34.4 和 68.1。排行第六至第十名的平均分數是多少？

- 33) Given $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{3}{8}$, where a, b, c and d are positive integers. [4.2%]

Find the value of $\frac{a}{d}$.

已知 $\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{3}{8}$ ，其中 a, b, c 和 d 都是正整數。

求 $\frac{a}{d}$ 的值。

- 34) There are 1001 different pairs of keys and locks. Each key corresponds to only one lock. Brittany mixes up 1001 different pairs of keys and locks. If Brittany needs to pair up all keys and locks by trial and error, what is the difference between the minimum and maximum number of trials? [4.3%]

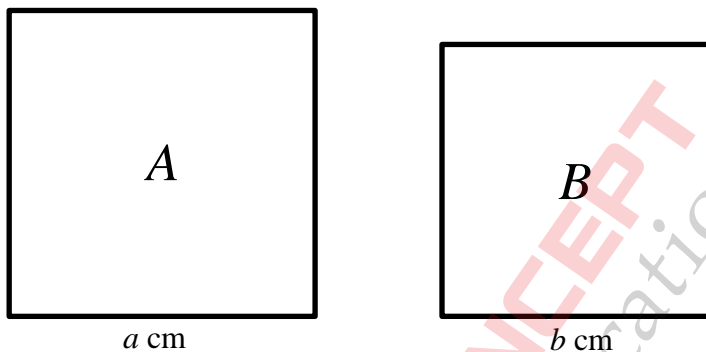
有 1001 對不同的鑰匙和鎖。每一把鑰匙只能開其唯一對應的鎖。庭欣把 1001 把鑰匙和 1001 把鎖弄亂了。若庭欣須把所有鑰匙和鎖重新配對，最少和最多的試開次數相差多少？

-
- 35) Grandma was born in the mid-20th century. The month she was born in had 5 Fridays, 4 Sundays, 4 Mondays, 4 Tuesdays, 4 Wednesdays, 4 Thursdays, 4 Saturdays. When Grandma is 100 years old, what is the day of the week on the 4th day of her birthday month? [4.4%]

婆婆於 20 世紀中期出生，她出生的月份有五個星期五，而星期日、一、二、三、四及六各有四個。當婆婆 100 歲時，該月的第 4 天是星期幾？

- 36) There are two squares A and B as shown below. The side lengths of square A and square B are a cm and b cm respectively, where a and b are integers. If the difference in areas between square A and B is 79 cm^2 , find the value of ab . [4.5%]

以下是正方形 A 及正方形 B 。正方形 A 和 B 的邊長分別為 a 厘米及 b 厘米，其中 a 和 b 都是整數。若正方形 A 和 B 的面積相差 79 平方厘米，求 ab 的值。



- 37) The clock in the classroom shows it is 8 o'clock in the morning now. After x minutes, the angle between the hour hand and the minute hand is 53° . Ricky finds that the clock in classroom is 3 minutes faster than the actual time. If $x < 60$ and x is an integer, the actual time after x minutes is _____?_____ in the morning. [4.6%]

課室內的時鐘顯示了目前的時間為上午 8 時正。 x 分鐘後，鐘面上的時針和分針的夾角等於 53° 。小明發現課室的時鐘原來比實際時間快了 3 分鐘。若 $x < 60$ ，且 x 為整數， x 分鐘後的實際時間是上午 _____?_____。

- 38) There are three natural numbers x , y and z . [4.7%]
If $32x + 31y + 32z = 1360$, find the value of $x + y + z$.

有 3 個自然數 x , y 和 z 。

若 $32x + 31y + 32z = 1360$, 求 $x + y + z$ 的值。

-
- 39) There are three kinds of giftpacks. In Giftpack A, there are [4.8%]
9 candies, 3 gums and 3 apples. In Giftpack B, there are 2 apples,
2 candies and 6 gums. In Giftpack C, there are 1 gum, 1 candy and
2 apples. What is the total number of giftpacks that Benson should
buy to get exactly 36 candies, 36 gums and 36 apples from these
giftpacks?

有三種福袋。福袋 A 有 9 顆糖果、3 顆口香糖和 3 個蘋果。福袋 B 有 2 個蘋果，2 顆糖果和 6 顆口香糖。福袋 C 有 1 顆口香糖、1 顆糖果和 2 個蘋果。若小輝想剛好得到 36 顆糖果、36 顆口香糖和 36 個蘋果，共需購買多少個福袋？

- 40) Given $N^2 - a = 2022$, $N^2 - b = 2021$, $N^2 - c = 2020$, and $abc = 160\frac{7}{8}$, where N , a , b and c are constants. [4.9%]

Find the value of $1 - \frac{a}{bc} - \frac{b}{ac} - \frac{c}{ab} + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}$.

已知 $N^2 - a = 2022$ ， $N^2 - b = 2021$ ， $N^2 - c = 2020$ ，

且 $abc = 160\frac{7}{8}$ ，其中 N 、 a 、 b 和 c 是常數。

求 $1 - \frac{a}{bc} - \frac{b}{ac} - \frac{c}{ab} + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ 的值。

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REG NO			P6
NAME			
GRADE			
SEAT			

ANSWER SHEET

IDCHECK

ABSENT

ANSWER		ANSWER		ANSWER		ANSWER	
1	30.6	11	$\frac{15}{16}$	21	616	31	42 (km/h)
2	57.7	12	$3\frac{1}{6}$	22	45.2	32	49.6
3	59.47	13	$\frac{21}{40}$	23	$33\frac{1}{3}(\%)$	33	$\frac{27}{512}$
4	213.2	14	$\frac{17}{20}$	24	7.2 (cm)	34	499500
5	5	15	$44\frac{1}{2}$	25	41.12 (cm ²)	35	Sunday/ 星期日/日
6	12.8	16	B / $\frac{3}{11}$	26	11.92 (cm)	36	1560
7	0.285	17	$\frac{y-5}{2} / \frac{y}{2} - 2\frac{1}{2}$	27	722 (cm ²)	37	8時31分 Eight thirty-one 8:31
8	0.287	18	B	28	2040 (sec)	38	43
9	0.32	19	364 (kg)	29	185	39	17
10	7.42	20	46.9%	30	6.25	40	$\frac{421}{429}$

