

2020
香港
數學盃
Hong Kong Mathematics Cup 2020
全港綜合數學能力大賽



P6

問題簿

Question
Booklet

姓名 Name : _____	參賽者編號 Reg No : <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
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限時：40分鐘

不允許使用計算機。

考生須知：

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參賽者編號。
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. 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。
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. 問題簿的附圖不一定依比例繪成。

Time : 40 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. 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. If the information printed on your answer sheet is not correct, please inform the invigilator immediately.
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.

Part 1 Calculation 運算題

1. $25 \div 49 = ?$ [2 marks]

(correct to the nearest thousandths) 準確至最接近千分位

2. $12.8 \div 2.5 \div 0.4 = ?$ [2 marks]

3. $0.4 \times \frac{1}{4} + 0.8 \times \frac{1}{8} + 0.16 \times \frac{1}{16} = ?$ [2 marks]

4. $60\% \div 0.5\% = ?$ (Answer in percentage) [2 marks]

5. $10\% \times 25\% \times 40\% =$ (Answer in percentage) [2 marks]

6. $12.5 \div 7 \times 5.6$ [2 marks]

7. $6.5 \times 99\frac{3}{13}$ [2 marks]

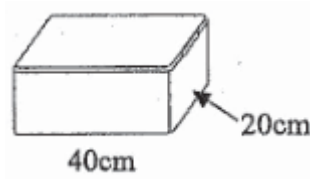
8. $493 \div 116 = ?$ [2 marks]

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Part 2 Fundamental Questions 基礎題

9. 10 litres of water are poured into a plastic box with length 40 cm and width 20 cm. What is the height of the water level in cm?
- 把 10 升水注入長 40cm，闊 20cm 的膠盒內，水的高度是多少 cm？ [3 marks]



10. If $x + 27 = 15$, then $3x + 50 = ?$ 若 $x + 27 = 15$ ，則 $3x + 50 = ?$ [3 marks]
11. Sally bought a pack of cheese balls and ate $\frac{1}{3}$ of them. Later, she bought another pack of cheese balls and then ate $\frac{1}{3}$ of all the remaining cheese balls. Finally, 90 cheese balls were left. How many cheese balls per pack are there?
- 小莉買了一包芝士球，吃掉 $\frac{1}{3}$ 。後來她再買多一包芝士球，然後吃掉全部餘下的 $\frac{1}{3}$ 。最後餘下 90 粒。問每包芝士球原有多少粒？ [3 marks]

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12. A 3-d shape has 186 edges and 124 vertices. How many faces does this 3-d shape have? 一個立體有 186 條稜，124 個頂，這個立體有多少個面？ [3 marks]
13. There is a promotion in a cake shop. Buy 3 get 2 free. What is the discount percentage? 蛋糕店進行推廣，買三送二。即打了多少折？ [3 marks]
14. The length of a ribbon is 90 cm. Kelly cuts the ribbon into segments of 4.6 cm each. Then she cuts the remaining part of the ribbon into segments of 1.3 cm each. How many segments are cut from the ribbon? 某絲帶長 90 cm。小潔把絲帶剪成每 4.6 cm 一段，然後把餘下的絲每 1.3 cm 剪成一段。最後共剪成絲帶多少段？ [3 marks]

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15. There are two groups of squares. How many cm^2 larger is the total area of the group 1 than that of the group 2? [3 marks]
- 下圖有兩組正方形，組一的總面積比組二的總面積大多少 cm^2 ？

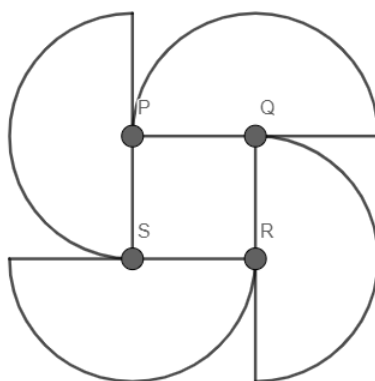
Group 1 組一		Group 2 組二	
			
2020 cm^2	2017 cm^2	2019 cm^2	2018 cm^2

16. Number A is $\frac{2}{3}$ of number B. Number B is 0.8 times that of number C. What percentage of number A is number C? [3 marks]
- 甲數是乙數的 $\frac{2}{3}$ ，乙數是丙數的 0.8 倍。丙數是甲數的百分之幾？

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17. The figure below is made of 4 identical semicircle and a square. If the perimeter of the square is 2.8 cm. Find the perimeter of the figure in cm.
(take $\pi = \frac{22}{7}$)
- 下圖由四個大小相同的半圓及一個正方形組成。若正方形的周界是 2.8 cm，下圖的周界是多少厘米？
(取 $\pi = \frac{22}{7}$)



18. The radius of a wheel of a bicycle is 21 cm. At least how many complete cycles of the wheel are needed to travel 300 metres?
- 單車車輪半徑 21 厘米。要行走 300 米，最少要轉動多少個完整的圈？

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Part 3 O Math Questions 奧數題

19. There is a bag of flour. 20% is used at first, then 10% of the remaining flour is used later. If a total of 1.4 kg of flour is used, how many kg of flour are there originally? 麵粉一包，先用去 20%，再用去餘下的 10%。若最後共用去 1.4 公斤。這包麵粉原有多少公斤？ [4.5 marks]
20. A total of 22 people from two schools A and B take part in a competition. $\frac{1}{5}$ of the number of participants in school A is 1 fewer than that in school B. How many participants are there in school B? 甲、乙兩校共有 22 人參加競賽，甲校參加人數的 $\frac{1}{5}$ 比乙校參加人數的 $\frac{1}{4}$ 少 1 人，乙校有多少人參加？ [4.5 marks]

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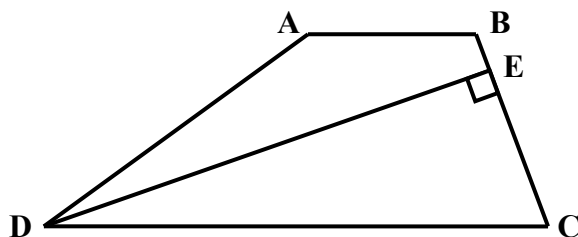
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21. 400 stickers are shared among some students. Each student can get at least one sticker, but not more than 11 stickers. At least how many students get the same number of stickers? 將 400 張貼紙分給若干名同學，每人 [4.5 marks]
都能分到至少一張貼紙，但都不能超過 11 張，最少有多少名同學得到的貼紙張數相同？
22. A, B, C, D, E and F are 6 points on a circle. Find the number of triangles that can be formed by linking these points. A, B, C, D, E 和 F 為圓上的 6 [4.5 marks]
點。求用這 6 點可以連起組成的三角形的數量。
23. Tommy was born in a day in 2002. The product of the day, month and year of the date of his birth is 638638. Which month was Tommy's birthday in? 小方 在 2002 年某月某日出生。他出 [4.5 marks]
生日的日、月、年之積剛好是 638638。小方 在哪月出生？

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24. In the figure, ABCD is a trapezium, the length of CD is twice the length of AB, BC is 5 cm, DE is 8 cm, find the area of trapezium ABCD.
- 在圖中，ABCD 是梯形，CD 的長度是 AB 的兩倍，BC 是 5cm，DE 是 8cm，求梯形 ABCD 的面積。 [4.5 marks]



25. In a simplest fraction, the numerator is 1 less than the denominator. If 83 is subtracted from the numerator and 116 is added to the denominator, the denominator is 6 times the numerator. Find the original fraction.
- 一個最簡分數，分子比分母少 1。若分子減去 83，分母加上 116，分母恰好是分子的 6 倍。求原來的分數。 [4.5 marks]

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26. Rewrite 14 as the sum of some natural numbers, what is the largest product of those natural numbers? [4.5 marks]
- 把 14 寫成若干個自然數的和，問這些數的積最大是多少？

27. How many 3-digit numbers with the hundreds digit larger than the tens digit and the tens digit larger than the units digit are there? [4.5 marks]
- 百位大於十位，同時十位又大於個位的三位數有多少個？

28. The sum of four numbers A, B, C, D is 85. [4.5 marks]
- 四個數字 A, B, C, D 之和是 85。

85.

$$\alpha = A^2 + B^3 + C^4 + D^5$$

$$\beta = A^3 + B^4 + C^5 + D^6$$

$$\chi = A^4 + B^5 + C^6 + D^7$$

$$\alpha = A^2 + B^3 + C^4 + D^5$$

$$\beta = A^3 + B^4 + C^5 + D^6$$

$$\chi = A^4 + B^5 + C^6 + D^7$$

α, β, χ 這幾個數中共有多少個奇數？

Among α, β, χ , how many odd numbers are there?

Please turn over the page.

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29. Find the integral part of the complex

fraction $\frac{1}{\frac{1}{30} + \frac{1}{31} + \frac{1}{32} + \frac{1}{33} + \frac{1}{34}}$ after

simplification.

求繁分數 $\frac{1}{\frac{1}{30} + \frac{1}{31} + \frac{1}{32} + \frac{1}{33} + \frac{1}{34}}$ 化簡 [4.5 marks]

後的整數部份。

30. X and Y starts their journeys from places

A and B respectively towards each other.

When they start their journeys, the ratio

of their speeds is 3:2. When they first

meet, X increases his speed by 20%, Y

increases his speed by 30%. Then, when

X arrives at place B, Y is still 28 km

apart from place A. What is the distance

between places A and B in km?

甲、乙兩人分別從 A、B 兩地出發，

相向而行，出發時他們的速度比是

3 : 2。他們第一次相遇後，甲的速度

提高了 20%，乙的速度提高了

30%。這樣，當甲到達 B 地時，乙離

A 地還有 28 公里。那麼 A、B 兩地

間的距離是多少公里？

End of paper

全卷完