



MathConceptition

2019

S1

Question Booklet

問題簿

Name:

姓名：

Reg. No.:

登記編號：

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Time: 1 hour

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.

限時：1小時

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登記編號。
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. 此問題簿的附圖不一定依比例繪成。

- 1) How many square numbers are there from 101 to 200? [3.0%]

由 101 至 200 之間，共有多少個平方數？

- 2) Find the 8th term of the sequence below. [3.1%]

求以下數列中第 8 項的數值。

$$-1, 3, -5, 7, -9, \dots$$

- 3) How many non-positive integers are there in between -9.3 and 7.7 ? [3.2%]

在 -9.3 至 7.7 之間共有多少個非正整數？

- 4) John is P years old. Sam is P years older than John. What is the sum of their ages after 5 years? [3.3%]

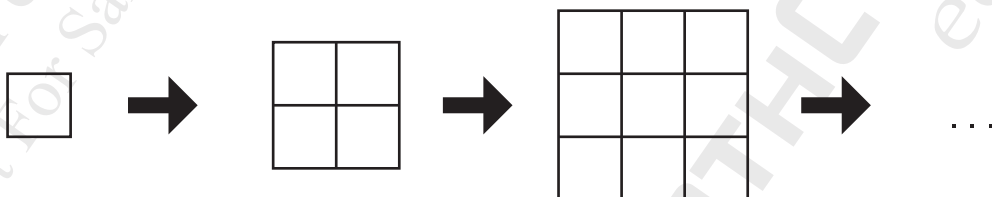
甲今年 P 歲，乙比甲大 P 歲。5 年後，甲和乙的歲數之和是多少？

- 5) Solve the equation $\frac{2-z}{3} + \frac{3-z}{4} = \frac{4-z}{2}$. [3.4%]

解方程 $\frac{2-z}{3} + \frac{3-z}{4} = \frac{4-z}{2}$ 。

- 6) The figures below are formed by squares with side of 2. What is the area of the $2n$ -th figure? [3.5%]

以下每個圖形均由邊長為 2 的小正方形所組成。求第 $2n$ 幅圖的面積。



- 7) Adam, Ben, and Carl have \$3000 altogether. Adam has \$100 more than five times the money Ben has. Carl has \$200 less than four times the money Ben has. How much does Carl have? [3.6%]

甲、乙、丙三人共有 3000 元。甲有的比乙的 5 倍多 100 元，而丙有的比乙的 4 倍少 200 元。問丙有多少元？

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- 8) If each side of an equilateral triangle is increased by 3 cm, the perimeter of the new triangle is $1\frac{1}{3}$ of the original one. Find the side length of the original triangle in cm. [3.7%]

若把一個等邊三角形的每邊延長 3 cm，它新的周界會是原來的 $1\frac{1}{3}$ 倍。原本等邊三角形的邊長是多少厘米？

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- 9) The reflex angle formed between the hour hand and the minute hand of a clock at 3:30 is n° . Find n . [4.8%]

當鐘面顯示的時間是 3:30，時針與分針組成的反角是 n° 。求 n 。

- 10) In an office, 80% of the staff were male. After hiring 5 more female staff, the percentage of female staff increases to 25%. Find the current number of staff in the office. [4.9%]

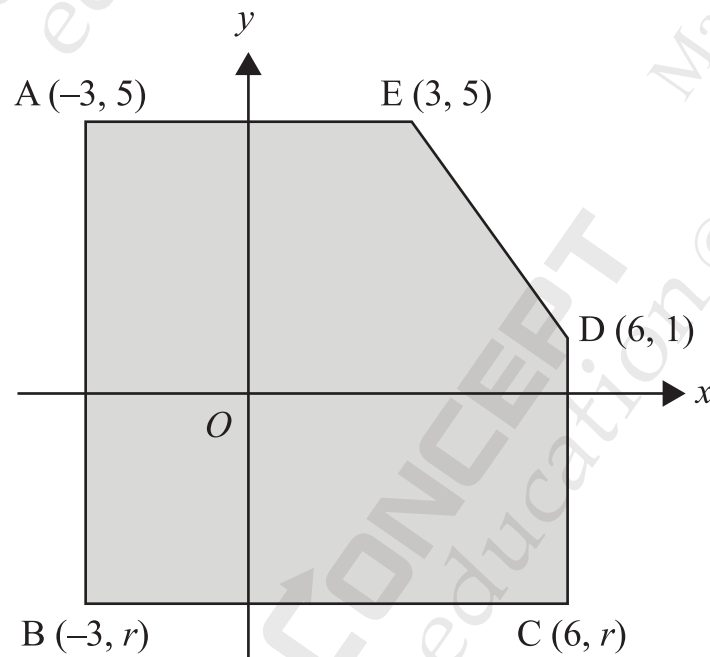
某公司原有 80% 的員工是男性。新聘請了 5 位女員工後，女員工的數目佔全部員工的 25%。該公司現有員工多少位？

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- 11) The distance between town A and town B is 400 km. A car traveled from town A to town B at a speed of 100 km/h for part of the journey and then decreased its speed to 80 km/h for the rest of the journey. If the total traveling time was 4.4 hours, how many kilometres did the car travel at the speed of 100 km/h? [5.1%]

甲、乙兩城相隔 400 km。一輛汽車由甲城開往乙城，起初以 100 km/h 行駛，隨後減速至 80 km/h，直至抵達乙城。若總車程為 4.4 小時，問汽車以 100 km/h 行駛的路程是多少公里？

- 12) In the figure, $ED = 5$ and the area of the shaded region is 75. Find the perimeter of ABCDE. [5.2%]

圖中著色部份的面積是 75， $ED = 5$ 。求 ABCDE 的周界。

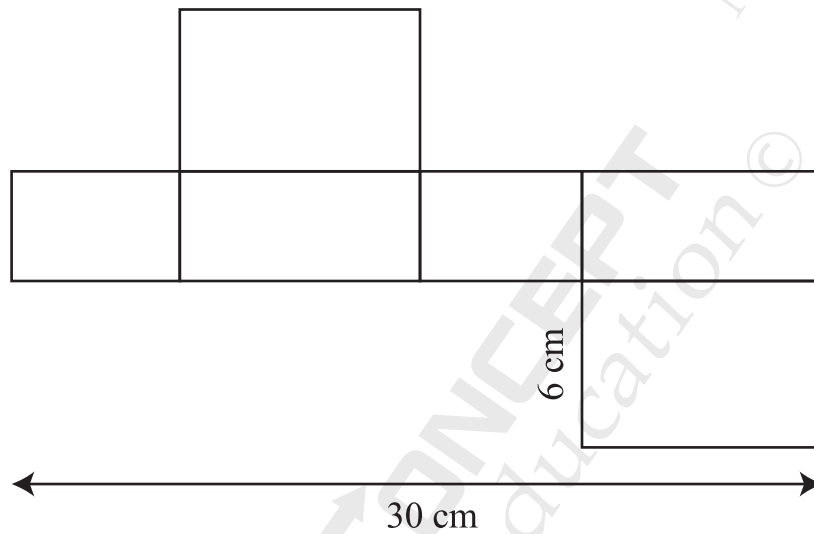


- 13) For how many integers n is $(3n + 7)(5n - 16)$ a negative number? [6.3%]

要使 $(3n + 7)(5n - 16)$ 成為負數， n 有多少個整數可能值？

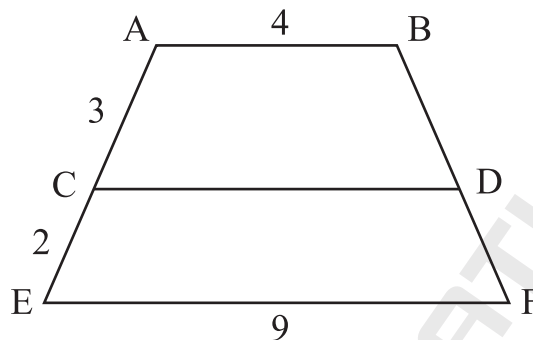
- 14) The figure shows the net of a cuboid. If the total surface area of the cuboid formed is 228 cm^2 , find the volume of the cuboid in cm^3 . [6.4%]

以下是一個長方體的摺紙圖樣。如果長方體的表面面積是 228 cm^2 ，問它的體積是多少立方厘米？



- 15) In the figure, $AB \parallel CD \parallel EF$. Find the length of CD . [6.5%]

圖中 $AB \parallel CD \parallel EF$ ，求 CD 的長度。

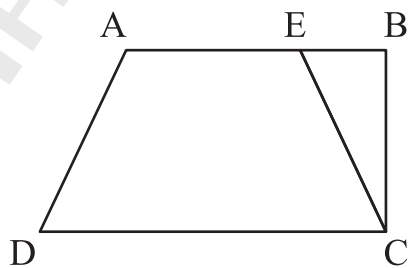


- 16) What is the remainder when the 100-digit number 20192019...2019 is divided by 7? [6.6%]

當 100 位數 20192019...2019 除以 7 時，餘數是多少？

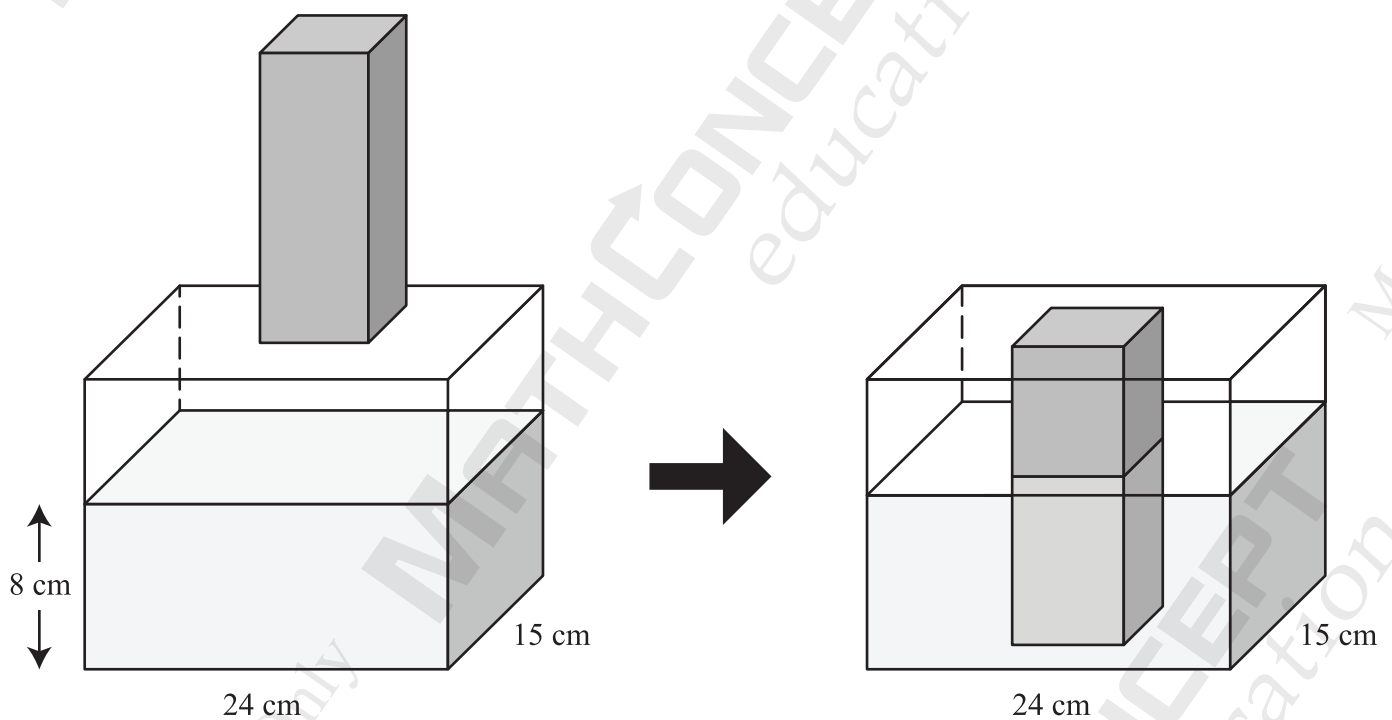
- 17) In the figure, ABCD is a trapezium, $DC = 2AE$, and $AE = 2EB$. If the area of $\triangle EBC$ is 24 cm^2 , what is the area of AECD in cm^2 ? [6.7%]

圖中 ABCD 是一個梯形， $DC = 2AE$ 及 $AE = 2EB$ 。如果 $\triangle EBC$ 的面積是 24 cm^2 ，問 AECD 的面積是多少平方厘米？



- 18) In the figure, a cuboid with 5 cm long, 4 cm wide and 15 cm high is vertically placed in a tank with part of it above the water level. Find the rise of the water level in cm. [6.8%]

如圖，把一個長 5 cm，闊 4 cm，高 15 cm 的長方體垂直放入容器後，長方體的一部份在水面之上。問水位上升了多少厘米？



- 19) In a class of 40 students, 75% of them like football, 80% of them like basketball, and 65% of them like volleyball. Each student in the class likes at least one of the sports above. If n students like all the three sports, find the smallest possible value of n . [6.9%]

一班學生有 40 人，當中喜歡踢足球的佔 75%，喜歡打籃球的佔 80%，喜歡打排球的佔 65%。若每名學生至少喜歡以上一種的球類，而有 n 名學生喜歡全部三種球類，求 n 的最小可能值。

- 20) Let ABCD be an arbitrary 4-digit number. Define [7.0%]

$$\rho(ABCD) = A^{ABCD} + B^{ABCD} + C^{ABCD} + D^{ABCD}$$

Find the last two digits of $\rho(2019)$.

設 ABCD 為一個任意四位數。定義

$$\rho(ABCD) = A^{ABCD} + B^{ABCD} + C^{ABCD} + D^{ABCD}$$

求 $\rho(2019)$ 最後兩個位的數值。



ANSWER SHEET

REG NO			S1
NAME			
GROUP			
SEAT			

ANSWER			ANSWER		
1	4	<input type="radio"/>	11	240	<input type="radio"/>
2	15	<input type="radio"/>	12	34	<input type="radio"/>
3	10	<input type="radio"/>	13	6	<input type="radio"/>
4	$3P + 10$	<input type="radio"/>	14	216	<input type="radio"/>
5	-7	<input type="radio"/>	15	7	<input type="radio"/>
6	$16n^2$	<input type="radio"/>	16	3	<input type="radio"/>
7	1040	<input type="radio"/>	17	144	<input type="radio"/>
8	9	<input type="radio"/>	18	$\frac{8}{17}$	<input type="radio"/>
9	285	<input type="radio"/>	19	8	<input type="radio"/>
10	80	<input type="radio"/>	20	78	<input type="radio"/>