

2023/24 第十四屆香港中學數學創意解難比賽

2023/24 The 14<sup>th</sup> Hong Kong Mathematics Creative Problem Solving Competition for  
Secondary Schools

答題紙 Answer sheets

學校編號 School Code : S \_\_\_\_\_

學校名稱 School Name :

得分 Score :

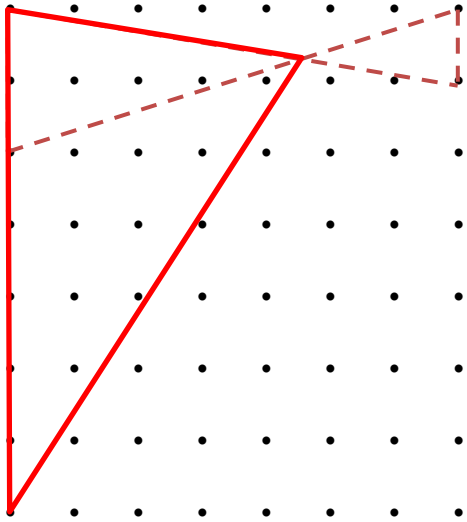
/40

甲部 Section A

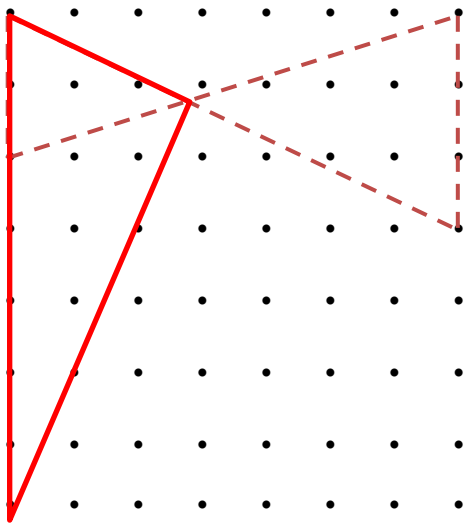
答案 Answers		評分 Marks
1.	$26 = 3! \times 2 \times 2 + \sqrt{4}$ $27 = 4! + 3 + 2 - 2$ $28 = (2 + 3 + 2) \times 4$ $29 = (3 + 2)^2 + 4$ $30 = 2^3 \times 4 - 2$	/5

2.

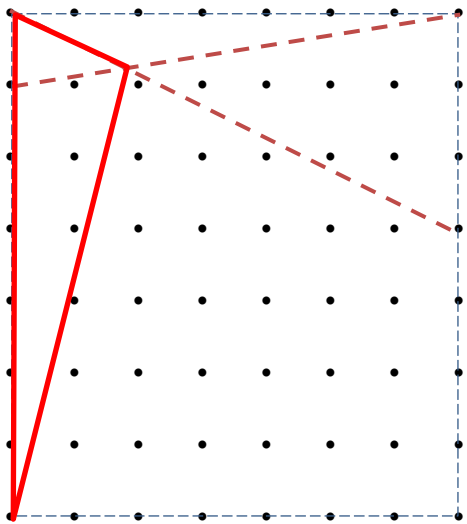
(a)



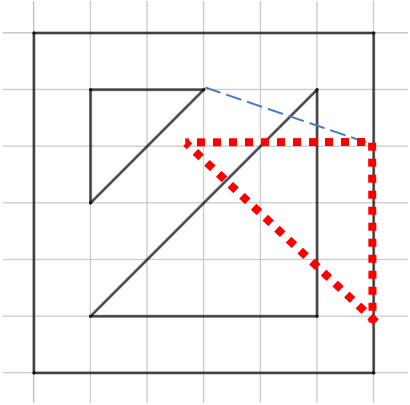
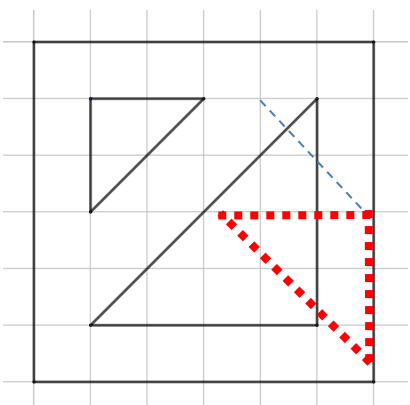
(b)

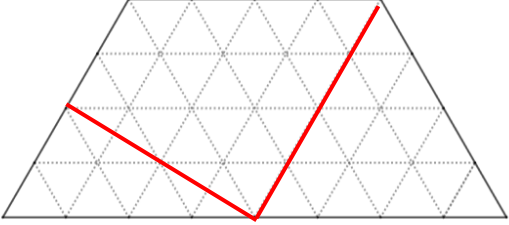
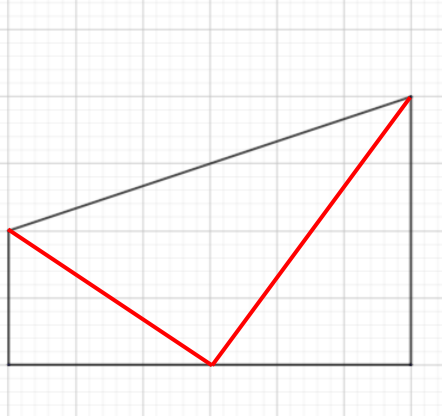


(c)

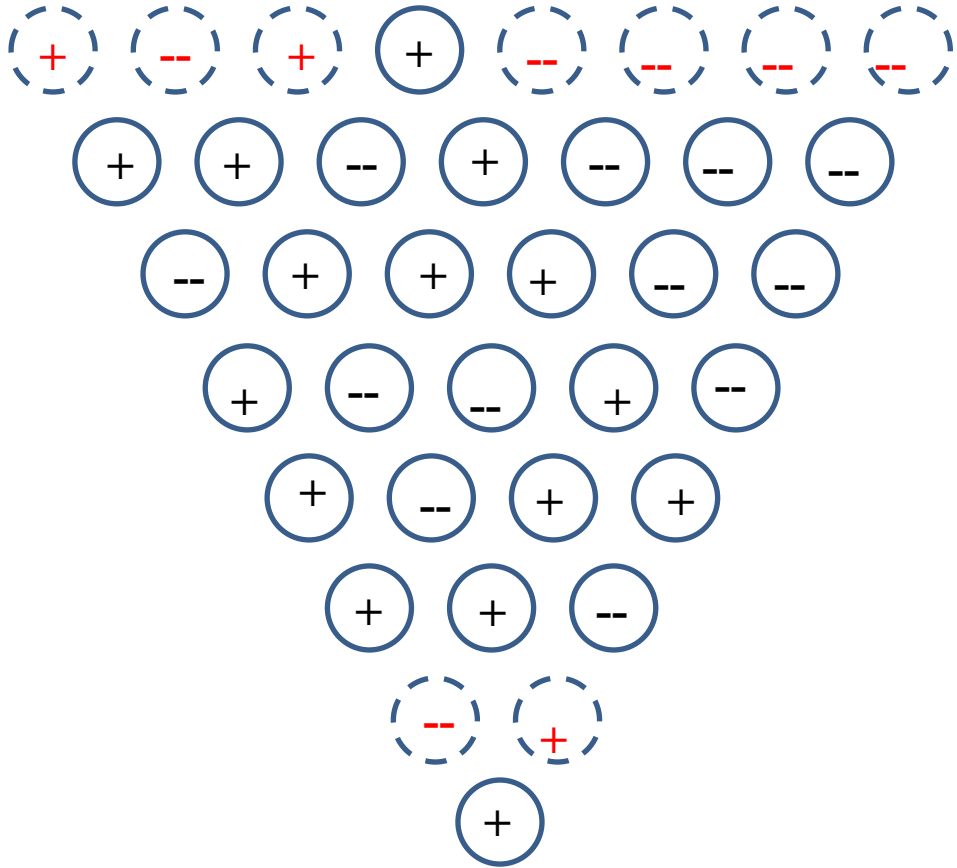


/3

3.	<p>(a)</p>  <p>(b)</p> 	/4
4.	<p>(a) <math>P = 20 \times 2 \times 432 = 20^7 \times 3^3 \times 5 = 17280</math></p> <p>(b) <math>P = 20243 \times 2 = 2 \times 31 \times 653 = 40486</math></p>	/4
5.	<p>Find <math>n</math>. 求 <math>n</math> 的值。 答： Answer: 19</p>	/2
6.	<p>求 <math>AHPE</math> 的面積。 Find the area of <math>AHPE</math>. 答： Answer: 5</p>	/2
7.	<p>求 <math>q - p</math> 的值。 Find the value of <math>q - p</math>. 答： Answer: -2024</p>	/2

<p>8.</p>	<p>求 <math>EF</math> 及 <math>GH</math> 間的距離。          Find the distance between <math>EF</math> and <math>GH</math>.          答：          Answer: <b>2.023 cm</b></p>	<p>/2</p>
<p>9.</p>	<p>(a)</p>  <p>(b)</p> 	<p>/4</p>

10.



/2

## 乙部 Section B

1. (a) 構作一個長度為 6 而只有 4 個刻度的「懶惰尺」。(1 分)  
Give an example of a 'Lazy Ruler' of length 6 with 4 markings. (1 mark)

{0, 1, 4, 6}

- (b) 保羅聲稱他可以構作一個長度為 11 而只有 5 個刻度的「懶惰尺」。是否可行？試解釋你的判斷。(2 分)

Paul claims that there is a 'Lazy Ruler' of length 11 with 5 markings only. Is that possible?  
Explain your judgement. (2 marks)

Since the number of ways of choosing 2 from 5 without repetition is  $10 < 11$ , it is impossible.

- (c) 一把長度為 11 的間尺最少需有多少個刻度才能成為「懶惰尺」呢？試舉例並解釋你的答案。(3 分)

What is minimum number of markings that a 'Lazy Ruler' of length 11 can have? Justify your answer and give an example. (3 marks)

6. From (b), 5 markings is not possible, the possible minimum is 6. We can construct an example of 6 markings like {0, 1, 2, 6, 9, 11}(or any other examples).

- (d) 另一把「懶惰尺」上刻度的數目和(c)題的一把相同，這把「懶惰尺」的長度最長為多少？(4 分)

Another 'Lazy Ruler' has the same number of markings as that in (c). What is the greatest length of this 'Lazy Ruler'? (4 marks)

Since the number of ways of choosing 2 from 6 is 15. The possible greatest length is 15. However, dealing case by case, we can find that 14 and 15 are unattainable, the greatest length is 13 only. An example with length 13 and 6 markings is {0, 1, 2, 6, 10, 13}(or any other examples).

全卷完  
End of Paper