

2014/15 第十届香港小学数学创意解难比赛  
(决赛暨粤港澳交流邀请赛 - 数学辩论/ 解难实验)

学校编号:	
学校名称:	

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**比赛时间：35 分钟**

参加者须知：


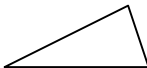
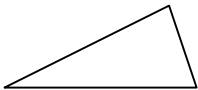
1. 每位同学将有一份(白色)问题卷和附页，每队另有一份(绿色)「答题卷」。
2. 答卷时段完结时，同学须递交(绿色)「答题卷」以便评判批改。于汇报时段同学可利用该卷的内容作为讲解的辅助。同学应将经讨论的答案、解释用的算式、文句或绘图等，清楚记于(绿色)「答题卷」的适当位置上。若有需要，亦可以记于算草纸上，于完卷时一并提交。
3. (白色)问题卷所记答案不会作为评分之用，同学可用作记录算式、解题心得等，于汇报和辩论时段作为参考。
4. 附页内有些与题目相关的资料。由于各队伍选取解题方案时有较大自主性和弹性，附页的内容不一定需要运用。
5. 参赛同学需自备文具及计算器。本比赛严禁使用电话、电子字典、计算机、或其他有上网或通讯功能的工具。
6. 比赛完毕后，同学必须交还所有问题卷、算草纸以及相关比赛用品。

## 答题卷 (Answer Sheets)

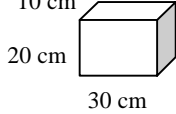
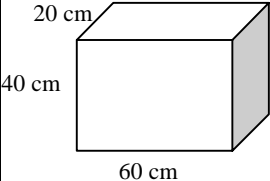
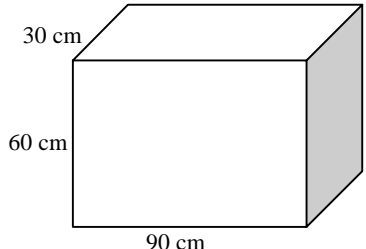
1. If the weight of a 1m long wire is 15g, what are the weights of 3m and 5m wires respectively?  
 如果一条 1m 长电线的重量是 15g, 试分别求两条 3m 及 5m 长电线的重量。

	1m	3m	5m
Weight of the wire 电线的重量	15g		

2. If the weight of a triangular plank of width 5m is 50kg, what are the weights of two similar triangular planks, which are cut from the same wooden plank, of widths 1m and 3m respectively?  
 如果一块阔 5m 三角形木板的重量是 50kg, 试求两块由相同木板裁出来的形状相似, 分别阔 1m 及 3m 三角板的重量。

	1m	3m	5m
			
Weight of the triangular plank 三角木板的重量			50kg

3. If the weight of a cuboid of sides 20 cm, 40cm and 60cm is 8kg, what are the weights of two cuboids indicated in the table below?  
 如果一个边长为 20 cm, 40 cm 和 60 cm 的长方体的重量是 8kg, 试求下表内两个不同大小的长方体的重量。

			
Weight of the cuboid 长方体的重量		8kg	



4. Referring to Q1, Q2 and Q3, try to identify the relationships for the three different objects.  
 观察 Q1, Q2 和 Q3, 试归纳出三种不同类型对象, 其重量如何随它的大小而改变。

Object 物件	The relationship between weight and size 重量和大小关系
Wire 电线	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Triangular plank 三角木板	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Cuboid 长方体	_____
	_____
	_____
	_____
	_____

5. Given the weight of a 3.5m tall Asian elephant is 4700kg. Estimate the weight of a 4m tall African elephant.

已知一只高 3.5m 的亚洲象，重量为 4700kg，试据此估算一只高 4m 非洲象的重量。

	 <p>3.5m tall Asian elephant 3.5m 高的亚洲象</p>	 <p>4m tall African elephant 4m 高的非洲象</p>
Weight of the elephant 大象的重量	4700kg	_____ _____ _____ _____ _____

6. Annex 1 shows a Koch Curve (note I), if there is another longer Koch Curve whose width is 3 times that of the Koch curve shown in Annex 1a, how many times is the weight of the longer Koch curve of the original one?

图 1 是一个科赫曲线 (注释 I), 假如有另一个较大的科赫曲线, 其阔度是图 1 所示图形的 3 倍, 求较大者的重量是本来那一条科赫曲线的多少倍?

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7. Annex 2 shows a Sierpinski Triangle (note II), if there is another bigger Sierpinski Triangle whose base is 4 times that of the Sierpinski triangle shown in Annex 2, how many times is the weight of the Sierpinski triangle heavier?

图 2 是一个谢尔宾斯基三角形(注释 II), 假如有另一个较大的谢尔宾斯基三角形, 其底边长度是图 2 所示的 4 倍, 求较大者的重量是本来那一个谢尔宾斯基三角形的多少倍?

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8. There is a picture of a Sierpinski pyramid in Annex 3. If there is another bigger Sierpinski pyramid whose base has a side doubles in length of that of the Sierpinski pyramid in Annex 3, how many times is the weight of the bigger Sierpinski pyramid heavier?

图 3 所示是一个谢尔宾斯基金字塔。假如有另一个较大的谢尔宾斯基金字塔, 底部边长是图 3 所示的两倍, 求较大者的重量是本来那一个金字塔的多少倍?

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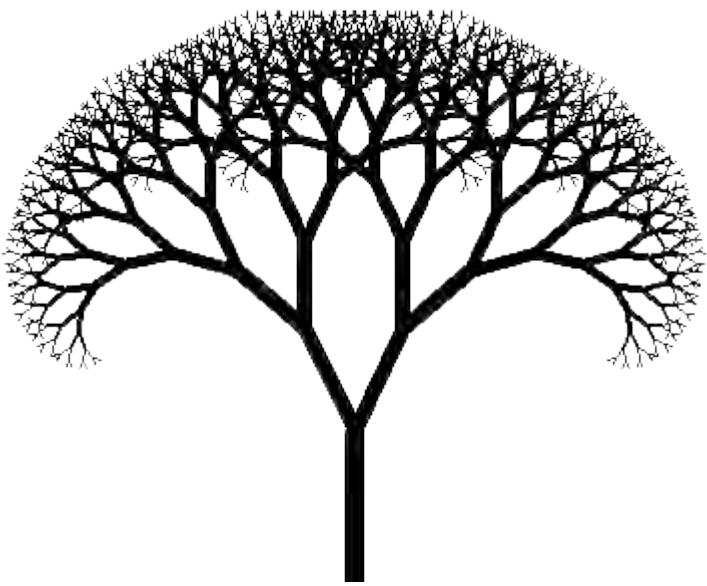
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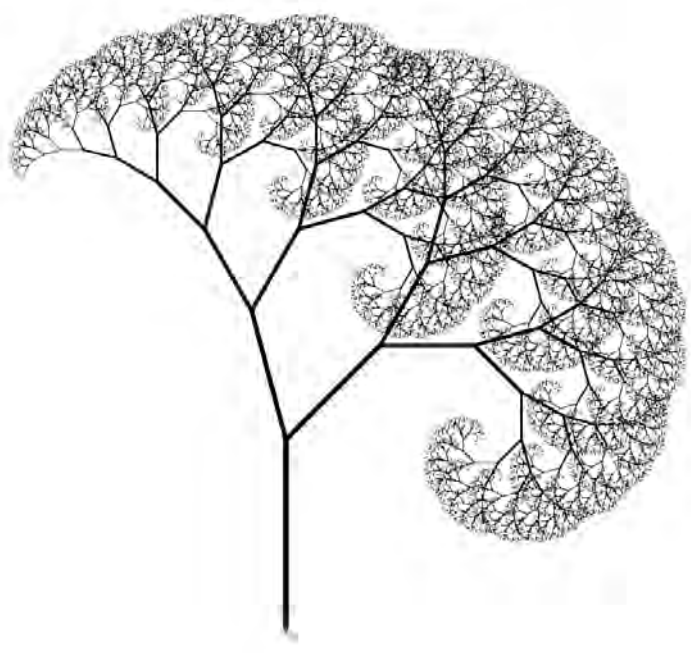
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9. With reference to the computer graphic of trees, try to figure out the rules in making these trees.

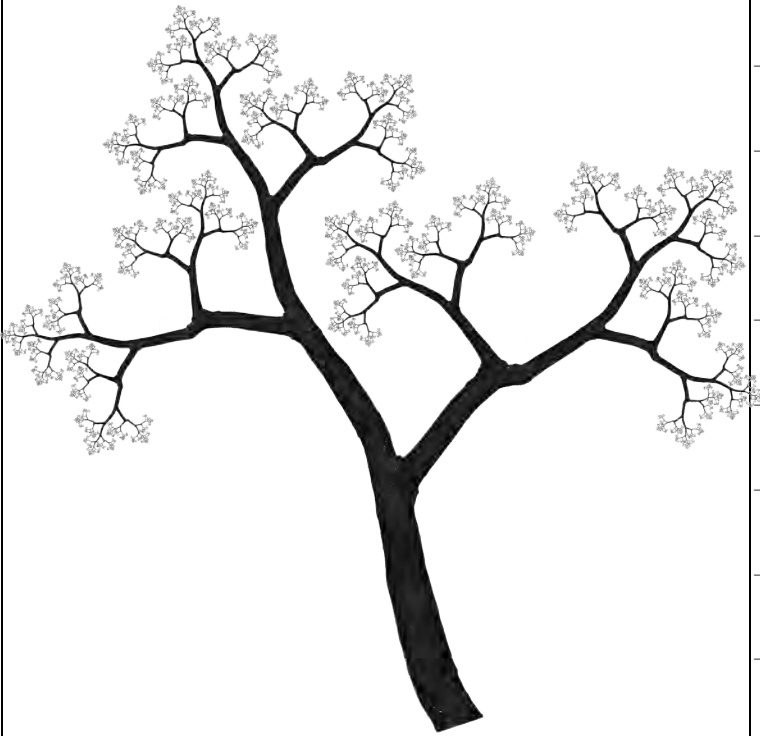
参考以下计算机绘制的树形图案，试简单描述计算机以甚么法则绘制出这些图案？

i.




iii.



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10. Are the silhouettes of tree in Q9 be classified into one of the class in Q4? Why?  
在题目 9 中的树木的剪影能否被归纳入题目 4 中的其中一项？为甚么？

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11. Refer to the news: 参考以下新闻报导:

半山塌树 压死孕妇 医生剖腹取胎 38周男婴命危 (苹果日报 2014年08月15日)  
本港发生六年来第四宗塌树杀人事件, 港岛半山罗便臣道豪宅一棵种在私人斜坡上、大约15米高的印度橡树, 疑受真菌感染树根腐烂突然塌落行人路, 将一名在路边等小巴、快将临盆的37岁孕妇击倒及压住, 孕妇头部重创, 倒地昏迷, 送院抢救后证实不治。

An English translation of Apple Daily 15/8/2015:

A fallen tree at Mid-levels killed a pregnant woman. The victim's baby was delivered by emergency caesarean section but was in a critical condition.

It was the fourth death in six years caused by a falling tree. A 15-metre-tall India-rubber tree which was suspected to be infected with fungi and brown root rot disease crashed down a private slope of a residential block on Robinson Road, Mid-levels. The tree fell on a 37 years old heavily pregnant woman who was waiting for a minibus on the roadside. She lost consciousness after being hit in her head by the tree and was pronounced dead at the hospital.

The table below shows some measurements the height of India-rubber trees and the above ground weight respectively. Estimate the above ground weight of the 15m India-rubber tree.

下表列出不同高度的印度橡树(只计露出地面的部份)及其重量。试估算报导中高15m的肇事橡树的重量。

Height of India-rubber tree/ m 印度橡树的高度 / m	Above ground weight of tree / kg 露出地面部份的重量 / kg
1.6	14.3
3.9	105
4.2	124
5.0	183
5.3	205
5.9	265
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