

# 圓錐曲線的故事

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建國中學數學科林炯伊整理

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# 問題

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拋物線為何跟圓錐扯上關係？

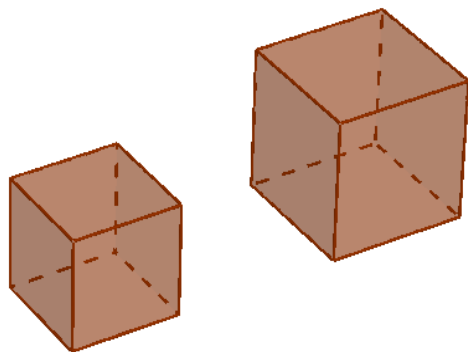
焦點準線的定義是哪裡來的？

# 據說是一場瘟疫造成的！

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神諭：

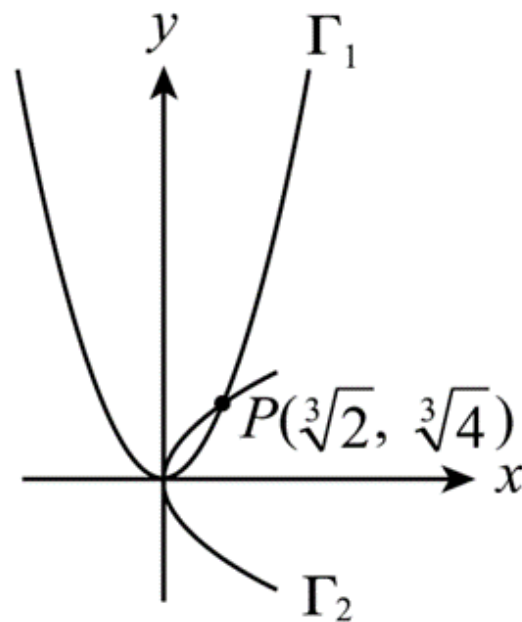
「要進獻給阿波羅神一個正立方體的祭壇，而且體積是現有提洛島正立方體祭壇的兩倍」



# 梅內屈模斯(Menechmus)

如果能找到  $x$  與  $y$  使得  $1:x = x:y = y:2$ ，問題就解決了！

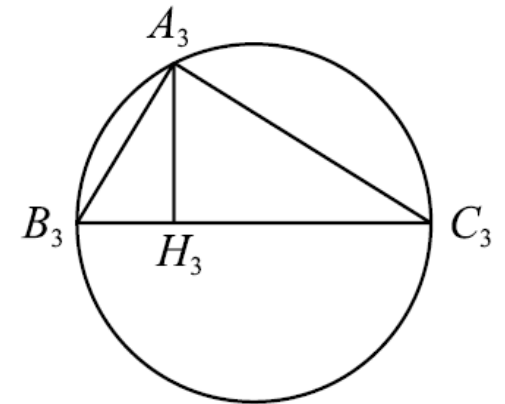
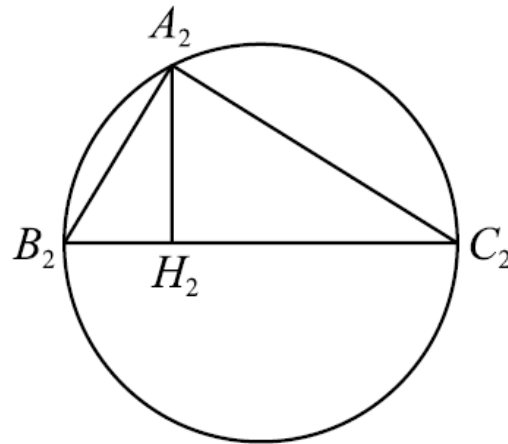
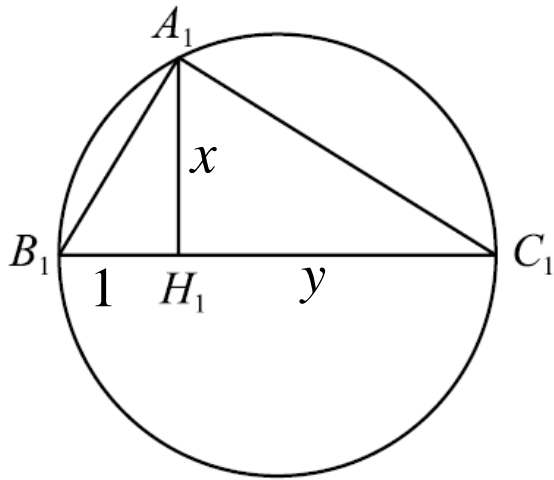
$$\begin{cases} \Gamma_1 : y = x^2 \\ \Gamma_2 : y^2 = 2x \end{cases}$$



# 梅内屈模斯(Menechmus)

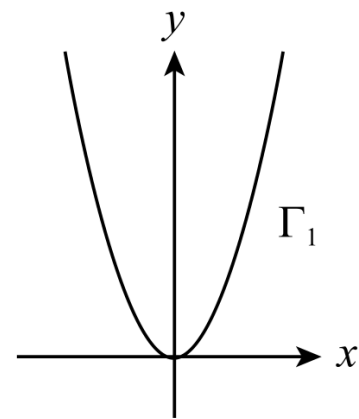
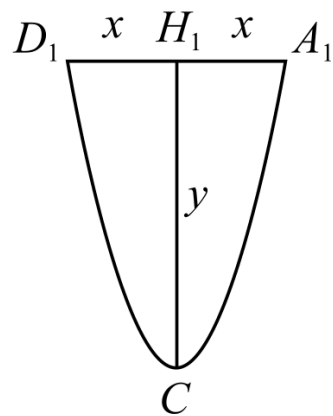
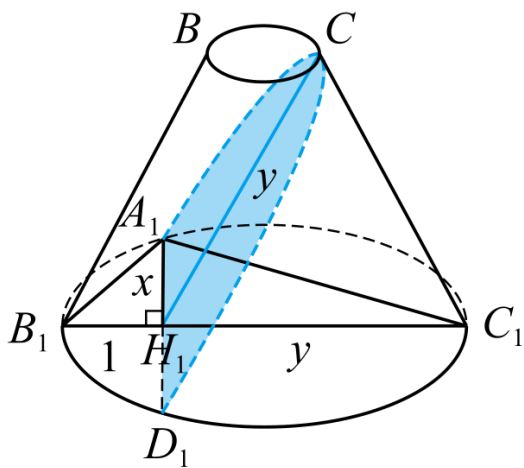
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$$\overline{B_1H_1} = \overline{B_2H_2} = \overline{B_3H_3} = \dots = \overline{B_nH_n} = 1$$



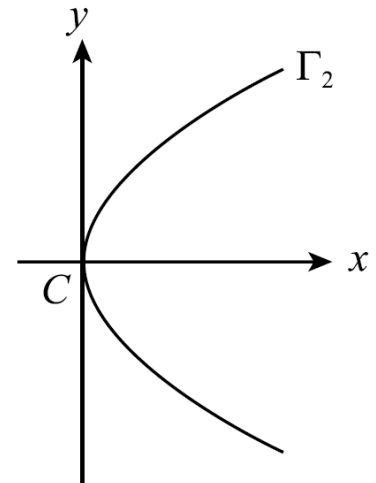
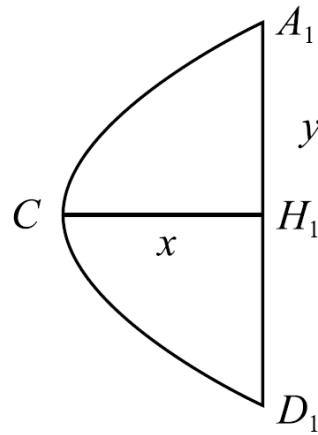
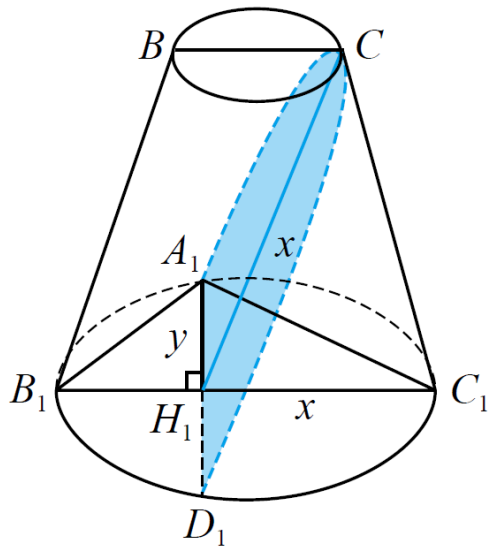
$\Gamma_1$ 

$$\angle BB_1C_1 = \angle CC_1B_1 = 60^\circ$$



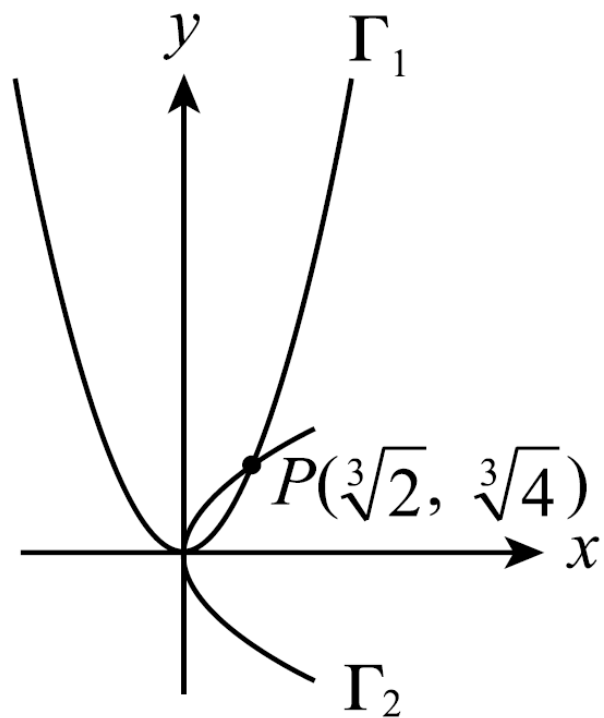
$\Gamma_2$ 

$$\angle BB_1C_1 = \angle CC_1B_1 = 60^\circ$$



$$\sqrt[3]{2}$$

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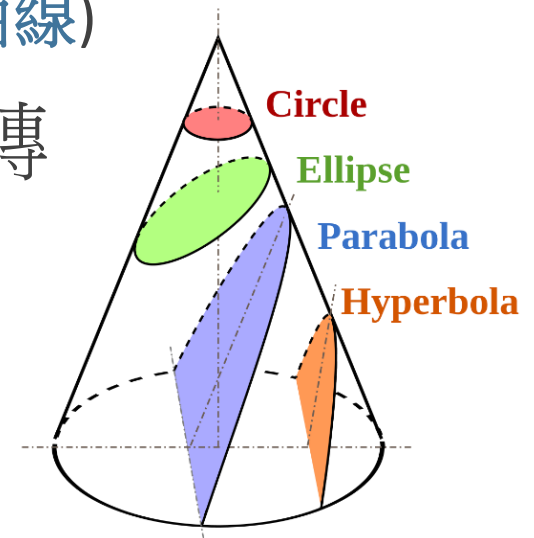
# 阿波羅尼奧斯 (Appollonius 262~190, B.C.)

將此曲線稱為 παραβολή

英文為 Parabola /pə'rabələ/

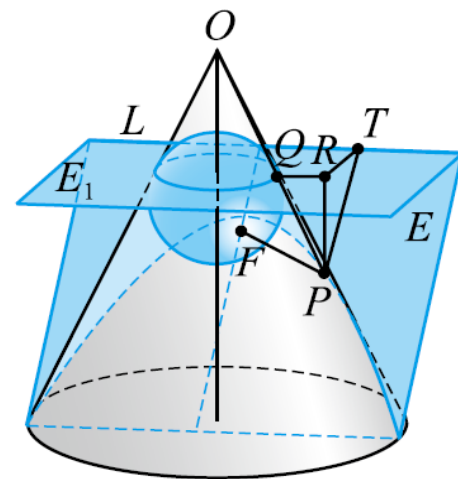
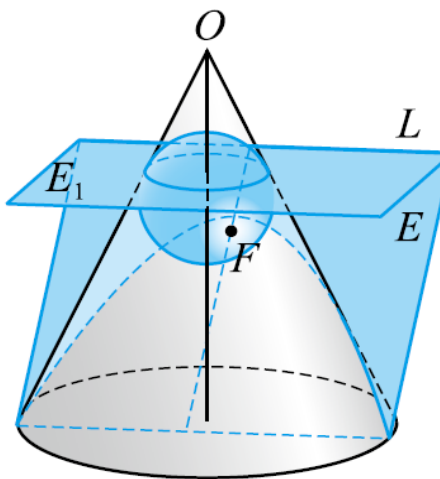
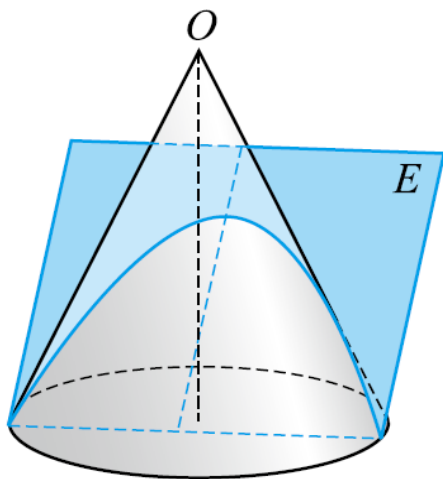
中文為 拋物線 (也許該翻譯成適截曲線)

方程式為  $y = ax^2$  之平移或旋轉



# 丹德林 (Dandelin 1794~1847)

發現 Parabola 的平面作圖法 (焦點準線法)



# 動手玩玩看

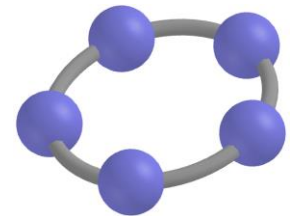
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圓錐與平面：<https://www.geogebra.org/m/zmxrztzy>

球的切線段性質：<https://www.geogebra.org/m/rhs2hptj>

圓錐截拋物線：<https://www.geogebra.org/m/dgujp2pa>

圓錐截橢圓與雙曲線：<https://www.geogebra.org/m/cjebnmyf>



# 問題

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拋物線(Parabola)為何跟圓錐扯上關係？

因為最早的Parabola是利用直角三角形的  
母子相似圖形堆疊成圓錐台，再切開而得。

焦點準線的定義是哪裡來的？

丹德林由圓錐截痕中精煉而出。

# 參考資料

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翁錫伍(2010)。圓錐曲線的第一堂課。99康熙數學報報3月號。