

# AUTOGRAPH DEVELOPMENT HISTORY

## ◆ Autograph 1 [Acorn], 1993

BBC BASIC programming by Douglas Butler (Oundle School, Peterborough, UK) based on an original concept by Philip Couzens.

### Autograph: THE GRAPH PLOTTER

**• EQUATION TYPES accepted (max: 156 characters)**

<p><b>Straight Lines</b>    <math>2x+3y = 3</math>            <math>y = 2</math></p> <p><math>y=f(x)</math>            <math>x &lt; 3y</math>                            <math>2x-3y \leq 4</math></p> <p>                      <math>y = 1/\sqrt{2\pi} e^{\lambda(-1-2x^2)}</math>    <math>y = \sin x/x</math></p> <p>                      <math>y = 2\sin^{-1}x</math>                    <math>y = 2x \pm \sqrt{1-x^2}</math></p> <p><math>y^2=f(x)</math>, etc      <math>y^2 = x(2x-3)</math>                    <math>xy = 4</math></p> <p><math>x=f(y)</math>            <math>x = \sinh^2 3y</math>                        <math>x^2 = y^2</math></p> <p><b>Conics</b>            <math>2x^2+4y^2 = 5</math>                        <math>x^2/4 - y^2/4 = 1</math></p> <p>                      <math>(2-x)^2 - 3(y-2)^2 = 9</math>            <math>2x^2 - 3xy - 5y^2 = x</math></p> <p><b>'Implicit Scan'</b>    any <math>f(x) = \text{any } g(x)</math>                <math>\sin x = \cos y</math></p>	<p><b>FUNCTIONS</b>      define <math>f(x)=\sin x</math>,            <math>g(x)=x^2</math>,</p> <p>                      then eg: <math>y=f(-x)</math>,            <math>y=f(g(x^2))</math></p> <p><b>'Piece-wise'</b>    <math>y = 1, \cos x, -1</math>                <math>[x=0 \text{ and } x=\pi]</math>.</p>
<p><b>POLAR</b>            <math>r = \sin 3\theta</math>                            <math>r^2 = \ln 1-z\theta </math></p> <p>                      <math>\theta = \pm 45^\circ</math>                            <math>1/r = 1 + e\cos\theta</math></p>	<p><b>Parametric</b>      <math>x = 2\sin\theta, y = 3\cos\theta</math>            <math>y = 2t, x = 4t^2</math></p>
<p><b>FAMILIES</b>        <math>y = mx+c</math>                            <math>x = \sin(\alpha t + \beta)</math></p> <p>                      <math>r = a\sin(m\theta) + b\cos(m\theta)</math></p>	
<p><b>Diff. Eqns</b>        <math>y' = f(x,y)</math>                            <math>2y' - 3xy = \sin 2x</math></p> <p>                      <math>y'' = f(x,y,y')</math>                      <math>2y'' - 3xy' - y = 2</math></p>	
<p><b>Simultaneous</b>    <math>y' = f(x,y,t), x' = g(x,y,t)</math></p>	

**• CALCULATIONS in the 'Cursor Mode'**

Trace, zoom

Tangent, normal, asymptote (with equations)

Area, volume, arc length, surface area, centroid, etc

Solving intersections (coordinates given)

Coordinate geometry; gradient investigation

Data analysis; data entry in true notation, eg ( $\sqrt{3}/2, e^2$ )

Best fit polynomials

**20x + 15y = k: variable line feature**             $y = -1.33x + 103$

A Linear Programming problem solved using the 'variable line' feature (k=1547). Note the axes labels and implicit equations.

$x + y \leq 120$

$x + y \geq 90$

$y \leq 50$

$x \leq 80$

**$x'' + 2\lambda x' + x = 0$  for  $\lambda = 0$  to 1, step 0.1 (0,2)  $x'(0)=0$**

A 2nd order Differential Equation in x-t: an example of the true-notation input used with the Autograph graph plotter.

## ◆ Autograph 2 [Windows], 2001

C++ programming + overall program design by Mark Hatsell  
 Concept and mathematical specification by Douglas Butler

### Introduction

- Autograph is dynamic software that operates in two modes:
  - Graphs and Coordinate Geometry
  - and Single-variable Statistics & Probability.
- Autograph, designed to help with visualising secondary and junior college level mathematics, draws coordinate geometry and statistics 'objects' which can be selected; dynamically linked 'secondary' objects can then be created.
- The **Graphs** section has 4 'primary' object types: equations, coordinate points ('cursors'), bivariate data sets and groups. The **Statistics & Probability** section uses grouped data (with or without raw data) and probability distributions.
- Autograph Extras is a small 'bonus' application gives a few illustrations of elementary mathematical topics using simulations.

### REFERENCE MANUAL

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### Autograph: Screen Layout

## ◆ Autograph 3 [Windows], 2004

Autograph 3.2 [Windows and Mac], 2007 -> Autograph 3.3 [Windows and Mac], 2011  
 15 languages, including Russian, Chinese and Arabic

### 香港數學科教師對 Autograph 的評價

- 功能多元化，針對老師課堂上的操作和課程重點而設計
- 當幕上的 Keyboard 使我用滑鼠便能控制整個 Autograph
- Autograph 的慢動作顯示，使學生更明白畫面的方法
- 用 Autograph 畫圖出卷易如反掌
- 終於有一套方便學生和老師在一維、二維及三維空間的學與教軟件
- Autograph 使我的數學課堂更精采
- Autograph 3.2 易於操作，緊貼教師的需要
- Autograph 是探索 Volume of Revolution 的最佳教學軟件
- Autograph：極為全面，無所不能！

**系統安裝要求：**

Windows 2000 (SP 3) ,  
 XP and VISTA ,  
 300MB 硬碟空間，  
 Internet Explorer 5 或以上，  
 3D 圖像時及驅動程式要  
 支援 Direct 3D Version 9 或以上

蘋果電腦用戶系統安裝要求，請登入：  
[http://www.autograph-math.com/about\\_autograph/](http://www.autograph-math.com/about_autograph/)

**1-2-3 教育資源社有限公司**  
 香港葵涌梨木園79號亞洲貿易中心1602室  
 電話：+852 2425 2628    傳真：+852 2425 6268  
 電郵：online@123era.com    網址：www.123era.com

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### Autograph version 3.2 ML

功能卓越全面 提升學習效益

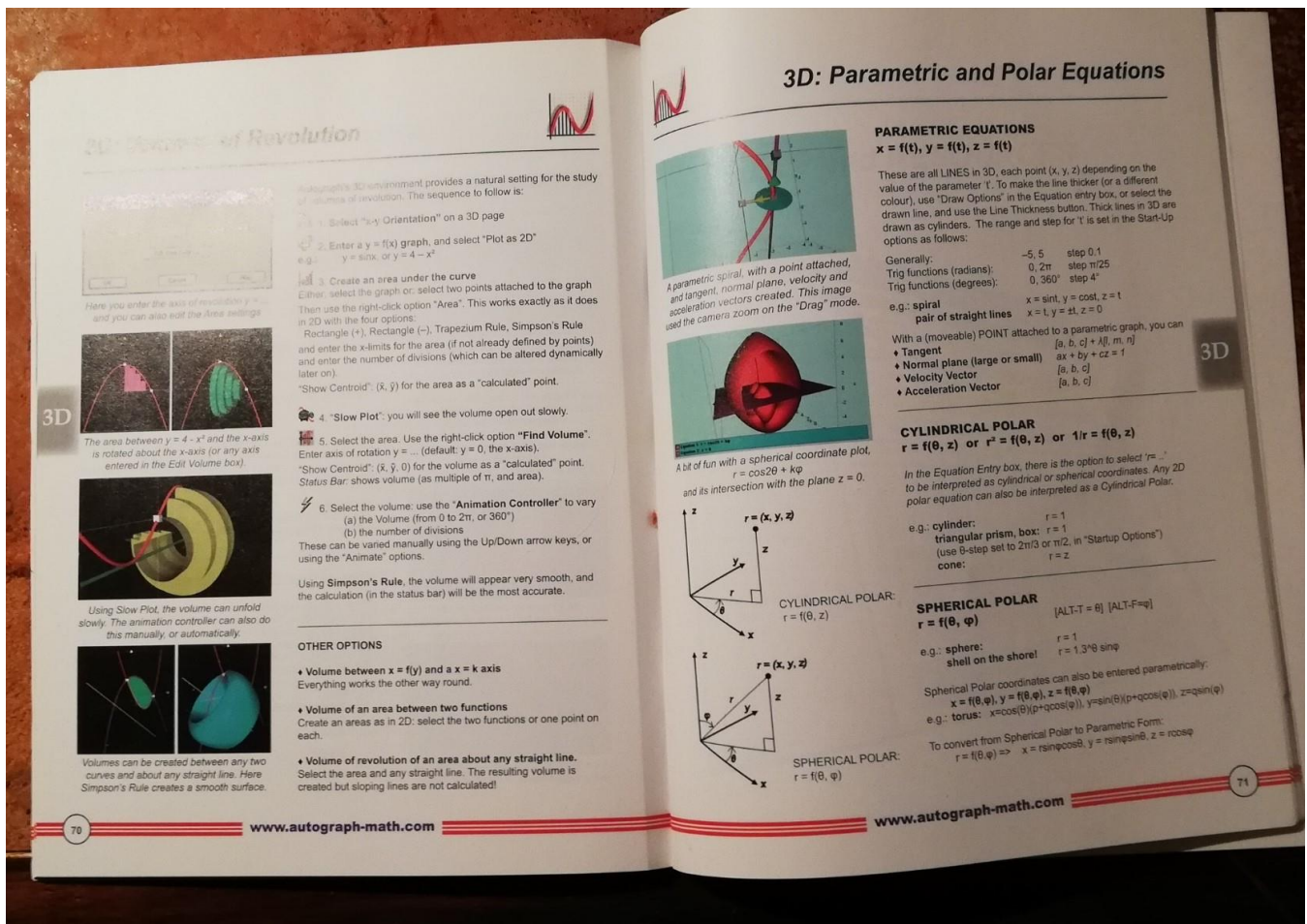
**功能包括：**

- 概率及統計學、動態幾何、二維及三維空間繪圖
- 集多項功能於一身，包括動態幾何、概率、統計學及三維空間繪圖
- 內置數學科專用螢幕顯示鍵盤
- 備有慢繪 (Slow Plot) 功能，啟發學生作更多思考及猜想
- 使用界面簡潔易明，可配合數位板 (互動電子手繪板) 或無線滑鼠在課室內插配使用
- Autograph 3.2 ML (Multi Lingual) 版，配備16種歐洲及亞洲語言，包括中文繁體及簡體版
- Autograph 與 Microsoft® Office 相容，只須簡單剪貼，便能在 Microsoft® Office 檔案展現高質素的圖像
- 10 倍圖像放大功能
- 內置白板模式，書寫行線相大

請即下載30天全功能試用版：  
[http://www.autograph-math.com/downloads/download\\_30daytrial.shtml](http://www.autograph-math.com/downloads/download_30daytrial.shtml)



## ◆ Autograph 3.2 Manual 2005



## ◆ Autograph 4 [Windows and Mac], 2018

Implementation of object attributes and associated operations

## ◆ Autograph 5 La Salle [Windows and Mac], 2019

Free of charge!

## ◆ World-wide distribution network covering 46 countries

Best markets for Autograph:

UK, International Schools, Hong Kong, Indonesia, Australia, New Zealand, South Africa, USA, Canada, Saudi Arabia, Russia

## ◆ TSM Residential Workshops

14 years of associated TSM workshops (Technology for Secondary Mathematics) at Oundle School July 2002 – 2015. Totals: 7000 teachers attending, 400 trainers trained, 40% of attendees from overseas.

D.E.Butler

15 January 2020