

一般簡報常用軟體不外乎使用 Microsoft Office PowerPoint，其好處是隨編隨看且背景、插圖、錄製聲音、投影片切換等功能齊全。但是對數學符號的處理則是相對的麻煩。原因是不管在 PowerPoint 或是 Word 中處理數學符號都必須使用方程式編輯器，而方程式編輯器編輯出最後的檔案都是以圖檔來表示。所以在 PowerPoint 中若是要編輯數學符號則必須將文字中留下一些空位，然後再將方程式編輯器編輯出的圖檔插入。當你若是要加入或是刪除一段話時整個版變都必須重新微調，因此相當花費時間。有鑑於此有人發展了 PowerPoint + TeX4PPT，讓 LaTeX 在 PowerPoint 裡也可以執行，雖然已能降低方程式編輯器的不便，但是相容性(可攜性)卻發生了問題(在沒有安裝 TeX4PPT 的電腦裡無法執行出預期結果)。

本課程將簡單介紹如何利用 MiKTeX 裡的 beamer class 來製作專業簡報。有別於 PowerPoint 或 PowerPoint + TeX4PPT，MiKTeX 裡的 beamer class 可以充分的展現出 LaTeX 編輯數學符號的優點，大大的提升了編輯的便利性、美觀性且兼顧到檔案的可攜性(編輯後的檔案為 PDF 檔)。

## 範例

```
\documentclass{beamer}
\usepackage{graphicx,pgf,CJK}
\usetheme{Darmstadt} % 投影片格式，有很多可以選擇
%\usetheme{Pittsburgh}%\usetheme{boxes}%\usetheme{Bergen}
%\usetheme{Boadilla}%\usetheme{Madrid}%\usetheme{AnnArbor}
%\usetheme{CambridgeUS}%\usetheme{Rochester}%\usetheme{Antibes}
%\usetheme{JuanLesPins}%\usetheme{Montpellier}%\usetheme{Berkeley}
%\usetheme{PaloAlto}%\usetheme{Goettingen}%\usetheme{Marburg}
%\usetheme{Hannover}%\usetheme{Berlin}%\usetheme{Ilmenau}
%\usetheme{Dresden}%\usetheme{Frankfurt}%\usetheme{Singapore}
%\usetheme{Szeged}%\usetheme{Copenhagen}%\usetheme{Luebeck}
%\usetheme{Malmoe}%\usetheme{Warsaw}

%\usecolortheme{seahorse} %投影片色彩配置，有很多可以選擇
%\usecolortheme{beaver}%\usecolortheme{crane}%\usecolortheme{orchid}
%\usecolortheme{rose}%\usecolortheme{albatross}%\usecolortheme{beetle}
%\usecolortheme{fly}%\usecolortheme{seagull}%\usecolortheme{wolverine}
%\usecolortheme{lily}%\usecolortheme{dolphin}

%%%%%%%%%%製造漸層效果背景
\def\softness{0.8}
\definecolor{softrb}{rgb}{1,\softness,1}
\colorlet{darkred}{red!80!black}
\beamertemplateshadingbackground{softrb}{blue!2}%{structure!10}
\beamertemplatetransparentcovereddynamic \beamertemplateballitem
\beamertemplatenumberedballsectiontoc
%%%%%%%%%%

%\setbeamercolor{normal text}{bg=red!10!green!10} %單純投影片背景顏色
\renewcommand{\d}{\displaystyle} % 造一個新指令\d = \displaystyle

\begin{document} %文章開始
\begin{CJK}{Bg5}{bsmi} %中文模式(細明體) (miktex 提供了細明體)
\title[The Beamer Class]{The Beamer Class} %報告名稱
\subtitle{Example} %報告副名稱
```

```

\author{Che-Hao, Lin}{林哲皓~~Che-Hao, Lin} %報告者
%\author{L. Hemaspaandra\inst{1} \and T. Tantau\inst{2}} %多人範例
\institute{Department of Mathematics, Tunghai University} %單位
%\institute{ %多人範例
%\inst{1}Department of Computer Science\\
%University of Rochester \and
%\inst{2}Fakult\"at f\"ur Elektrotechnik und Informatik\\
%Technical University of Berlin}
\date{2010,4,7} %日期
%\date{\empty} %不要日期
%\date{\today} %今日日期

% p1 ~~~~~
\frame{
\titlepage %製作抬頭頁
}

\logo{\includegraphics[height=9cm]{thu3.jpg}} % 插入 logo

% p2 ~~~~~
\frame{%大綱
\tableofcontents[pausesections] %[pausesections] 表示一項一項列出
}

% p3-5 ~~~~~
\section{Section 1}
\subsection{Definition and example}
\frame{ %本頁投影片開始 也可以用 \begin{frame}
\frametitle{What Are Prime Numbers?} %本頁標題
\begin{definition} %定義環境
A \alert{prime number} is a number that has exactly two divisors.
\end{definition}
\begin{example} %例子環境
\begin{itemize}
\item 2 is prime (two divisors: 1 and 2).
\item 3 is prime (two divisors: 1 and 3).
\item 4 is not prime (\alert{three} divisors: 1, 2, and 4).
\end{itemize}
\end{example}
\begin{example}
\begin{itemize}[<+>] %加[<+>]是一種暫停的指令
\item 2 is prime (two divisors: 1 and 2).
\item 3 is prime (two divisors: 1 and 3).
\item 4 is not prime (\alert{three} divisors: 1, 2, and 4).
\end{itemize}
\end{example}
} %本頁投影片結束 也可以用 \end{frame}

% p6-8 ~~~~~
\frame{ %本頁投影片開始
\begin{example}
\begin{itemize} %另一種方式用 pause
\item 2 is prime (two divisors: 1 and 2).
\pause
\item 3 is prime (two divisors: 1 and 3).
\pause
\item 4 is not prime (\alert{three} divisors: 1, 2, and 4).
\end{itemize}
\end{example}
} %本頁投影片結束

```

```

% p9-12 ~~~~~
\begin{frame}[<+>] %本頁投影片開始 [<+>]每一項會輪流出現
\begin{example}
\begin{itemize}
\item 2 is prime (two divisors: 1 and 2).
\item 3 is prime (two divisors: 1 and 3).
\item 4 is not prime (\alert{three} divisors: 1, 2, and 4).
\end{itemize}
\end{example}
\end{frame}%本頁投影片結束

% p13-15~~~~~
\subsection{Theorem}
\subsection{proof}
\frame { %本頁投影片開始
\frametitle{There Is No Largest Prime Number}%本頁標題
\transwipe[direction=0]
% 換頁效果請自行試看看[direction=90],[direction=180],[direction=270],有何不同
\framesubtitle{The proof uses \it{reductio ad absurdum}.}%本頁副標題
\begin{theorem} %定理環境
There is no largest prime number.
\end{theorem}
\begin{proof}
\begin{enumerate} % 注意 item 裡面數字的意義
\item<1-| \alert@1> Suppose  $p$  were the largest prime number.
\item<2-> Let  $q$  be the product of the first  $p$  numbers.
\item<3-> Then  $q+1$  is not divisible by any of them.
\item<1-> Thus  $q+1$  is also prime and greater than  $p$ . \qedhere
\end{enumerate}
\end{proof}
} %本頁投影片結束

% p16~~~~~
\section{Section 2}
\frame { %本頁投影片開始
\frametitle{Lemma and Corollary} %本頁標題
\transdissolve %換頁產生溶解效果
\begin{lemma} %Lemma 環境
Lemma
\end{lemma}
\begin{corollary} %corollary 環境
Corollary
\end{corollary}
\newtheorem{prop}{Proposition} %定義 proposition 環境
\begin{prop}
Proposition
\end{prop}
} %本頁投影片結束

% p17-18 ~~~~~
\begin{frame}[t] % [c]置中 [b] 置下 [t] 置上
\frametitle{There Is No Largest Prime Number}
投影片置上
\end{frame}
\begin{frame}[b] % [c]置中 [b] 置下 [t] 置上
\frametitle{There Is No Largest Prime Number}
投影片置下
\end{frame}

```

```

% p19~-----
\section{Section 3}
\frame {
\frametitle{各種框}
\begin{block}{Answered Questions} %藍色框
How many primes are there?
\end{block}
\begin{alertblock}{Open Questions} %紅色框
Is every even number the sum of two primes?
\end{alertblock}
\begin{exampleblock}{green} %綠色框
綠色框框
\end{exampleblock}
}

% p20~-----
\subsection{Two Column}
\frame {
\frametitle{兩欄模式}
\begin{columns} %兩欄模式
\column{.4\textwidth} %第一欄佔 40%
\begin{block}{Answered Questions}
How many primes are there?
\end{block}
\column{.6\textwidth} %第二欄佔 60%
\begin{block}{Open Questions}
Is every even number the sum of two primes?
\end{block}
\end{columns}
}

% p21-24~-----
\subsection{Thm and Pf}
\begin{frame}[<+>-]
\begin{theorem}
 $A = B$ .
\end{theorem}
\begin{proof}
\begin{itemize}
\item Clearly,  $A = C$ .
\item As shown earlier,  $C = B$ .
\item<3-> Thus  $A = B$ .
\end{itemize}
\end{proof}
\end{frame}

% p25-28~-----
\begin{frame}
\begin{itemize}
\item Shown from first slide on. \pause %\pause 暫停顯示
\item Shown from second slide on.
\begin{itemize}
\item Shown from second slide on. \pause
\item Shown from third slide on.
\end{itemize}
\item Shown from third slide on. \pause
\item Shown from fourth slide on.
\end{itemize}
Shown from fourth slide on.
\begin{itemize}
\onslide %一開始就顯示
\item Shown from first slide on. \pause

```

```

\item Shown from fifth slide on.
\end{itemize}
\end{frame}

% p29-34~~~~~

\begin{frame}
\begin{itemize}
\item Shown from first slide on. \pause[4] %\pause[number] 第 number 個顯示
\item Shown from second slide on.
\begin{itemize}
\item Shown from second slide on. \pause[5]
\item Shown from third slide on.
\end{itemize}
\item Shown from third slide on. \pause[2]
\item Shown from fourth slide on.
\end{itemize}
Shown from fourth slide on.
\begin{itemize}
\onslide % 一開始就顯示
\item Shown from first slide on. \pause[3]
\item Shown from fifth slide on.
\end{itemize}
\end{frame}

% p35~~~~~
\section{Picture}
\begin{frame} %三張圖同一張投影片
\hypertarget{1.1}{}
\frametitle{插圖}
\includegraphics[width=3.5cm,height=2.5cm]{1.jpg}
\includegraphics[width=3.5cm,height=2.5cm]{2.jpg}
\includegraphics[width=3.5cm,height=2.5cm]{3.jpg}
\end{frame}

% p36-38~~~~~

\begin{frame} %三張圖分三張投影片
\frametitle{同一標題三張圖分三張投影片}
\includegraphics<1>{1.jpg}
\includegraphics<2>{2.jpg}
\includegraphics<3>{3.jpg}
\end{frame}

% p39~~~~~
\begin{frame}
\begin{figure}
\includegraphics{1.jpg}
\caption{This caption is placed below the figure.} %插圖說明
\end{figure}
\end{frame}

% p40~~~~~
\begin{frame}
\frametitle{連結}
\textcolor{rgb}{0.00,0.00,1.00}{投影片內部連結}

\hyperlink{1.1}{第 35 頁}

\textcolor{rgb}{0.00,0.00,1.00}{外部連結}

```

```

\href{Flowers.pdf}{圖片}

\href{Beamer.doc}{講義}
\end{frame}

% p41~~~~~
\section{References}
\frame{
  \frametitle<presentation>{References}

\begin{thebibliography}{10}
\beamertemplatebookbibitems %參考文獻(圖書樣)
\bibitem{Author1990}
  A.~Author.
  \newblock {\em Handbook of Everything}.
  \newblock Some Press, 1990.

\beamertemplatearticlebibitems %參考文獻(論文樣)
\bibitem{Someone2000}
  S.~Someone.
  \newblock On this and that.
  \newblock {\em Journal of This and That}, 2(1):50--100,
  2000.
\end{thebibliography}
}
\end{CJK}
\end{document}

```

以上範例可使用 PDFLaTeX 編輯(若有插入 jpg 檔或 pdf 檔)，亦可使用 LaTeX+dvips+pspdf 編輯(若有插入 eps 檔)

Beamer 原文版使用手冊 beameruserguide.pdf 可以在 C:\Program Files\MiKTeX 2.X\doc\latex\beamer\doc 裡找到 (2.X 指 MiKTeX 的版本 2.6, 2.7 或 2.8)

Beamer 其他範例可參考 C:\Program Files\MiKTeX 2.X\doc\latex\beamer\examples 本文以及範例原檔可上 <http://web.thu.edu.tw/linch/www/beamer.htm>

## 作 業

請利用 Beamer class 製作一份介紹微積分或高等微積分內某一個定理(可自選)之簡報，必須包含抬頭頁、定理敘述及證明或應用等，其內容至少五頁。

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The Beamer Class  
Example

林哲皓 Che-Hao, Lin

Department of Mathematics, Tunghai University

2010,4,7

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- Definition and example
- Theorem
- proof

2 Section 2

3 Section 3

- Two Column
- Thm and Pf

4 Picture

5 References

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References

Definition and example

What Are Prime Numbers?

Definition

A **prime number** is a number that has exactly two divisors.

Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

Example

- 2 is prime (two divisors: 1 and 2).
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Definition and example

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Definition and example

Example

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**Example**

- 2 is prime (two divisors: 1 and 2).
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**Example**

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

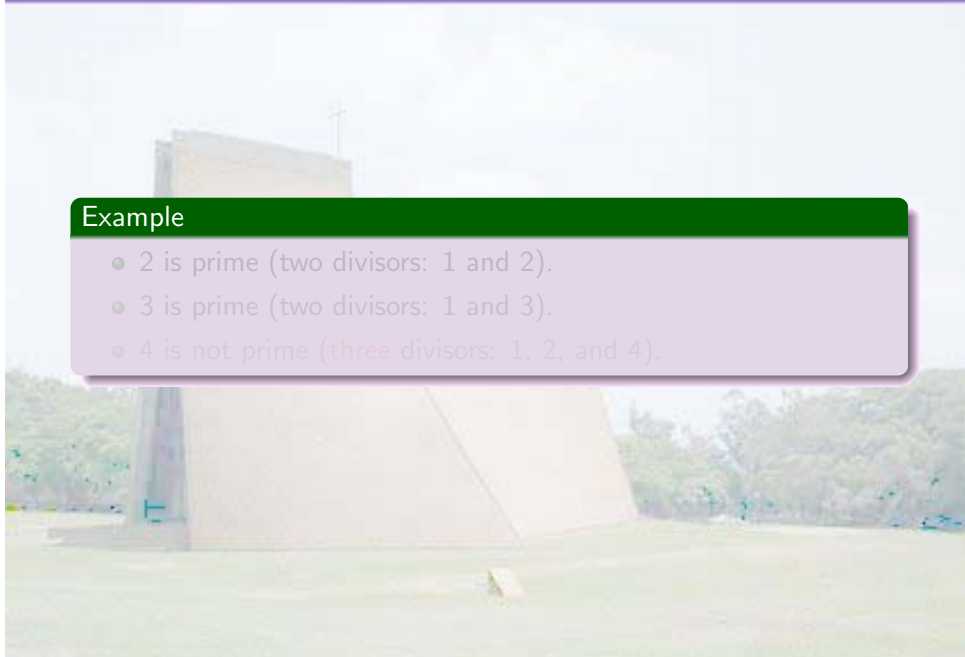
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**Example**

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

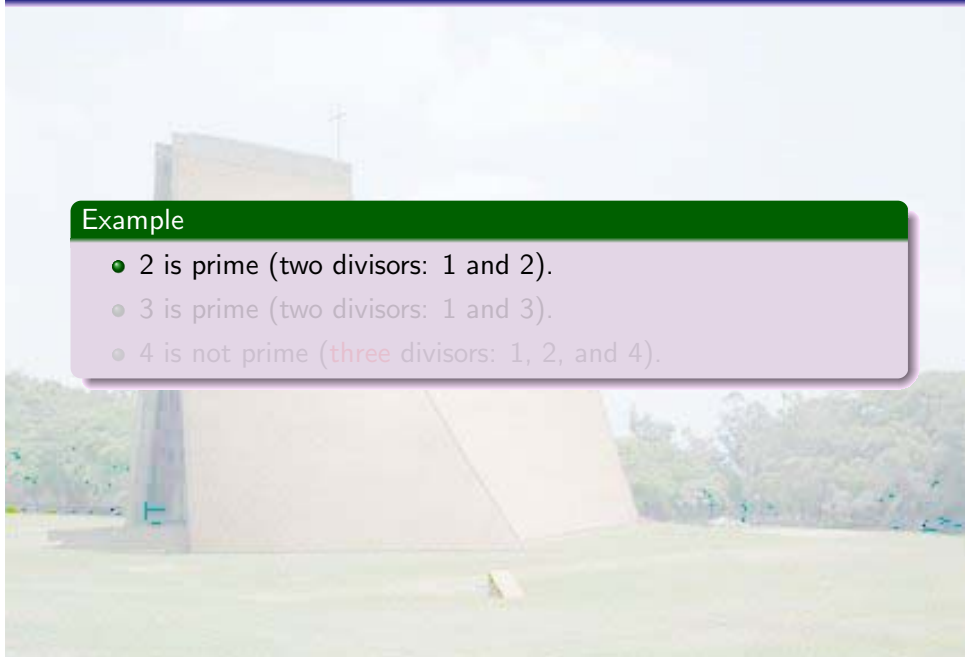
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**Example**

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
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Definition and example



Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
- 4 is not prime (**three** divisors: 1, 2, and 4).

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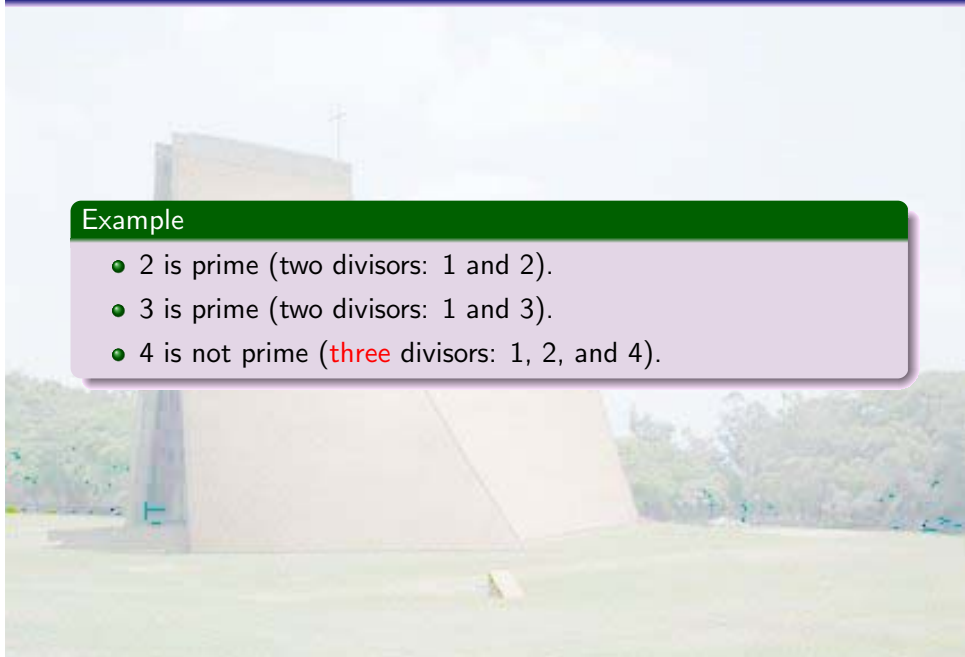
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Definition and example



Example

- 2 is prime (two divisors: 1 and 2).
- 3 is prime (two divisors: 1 and 3).
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proof

There Is No Largest Prime Number

The proof uses *reductio ad absurdum*.

Theorem

There is no largest prime number.

Proof.

❶ Suppose  $p$  were the largest prime number.

❷ Let  $q$  be the product of the first  $p$  numbers.

❸ Then  $q + 1$  is not divisible by any of them.

❹ Thus  $q + 1$  is also prime and greater than  $p$ . □

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The proof uses *reductio ad absurdum*.

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proof

There Is No Largest Prime Number

The proof uses *reductio ad absurdum*.

Theorem

*There is no largest prime number.*

Proof.

- 1 Suppose  $p$  were the largest prime number.
- 2 Let  $q$  be the product of the first  $p$  numbers.
- 3 Then  $q + 1$  is not divisible by any of them.
- 4 Thus  $q + 1$  is also prime and greater than  $p$ . □

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Lemma and Corollary

Lemma

*Lemma*

Corollary

*Corollary*

Proposition

*Proposition*



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各種框

Answered Questions

How many primes are there?

Open Questions

Is every even number the sum of two primes?

green

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Two Column

兩欄模式

Answered Questions

How many primes are there?

Open Questions

Is every even number the sum of two primes?



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Theorem

$A = B.$

Proof.

- Clearly,  $A = C.$
- As shown earlier,  $C = B.$
- Thus  $A = B.$

□

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- Shown from first slide on.
- Shown from fifth slide on.

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- Shown from fifth slide on.

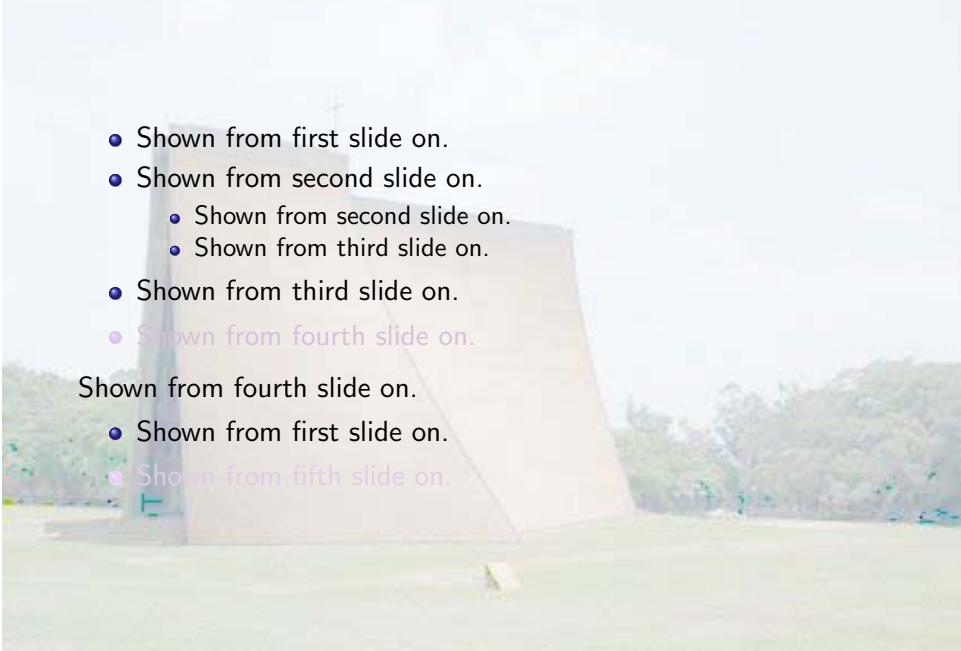
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References



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- Shown from second slide on.
  - Shown from second slide on.
  - Shown from third slide on.
- Shown from third slide on.
- Shown from fourth slide on.

Shown from fourth slide on.

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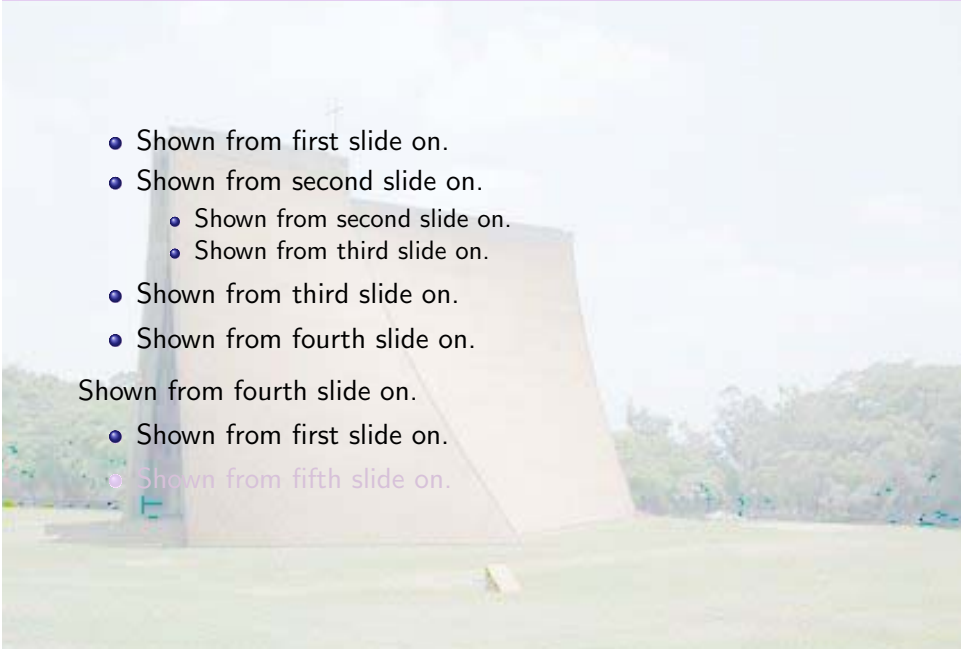
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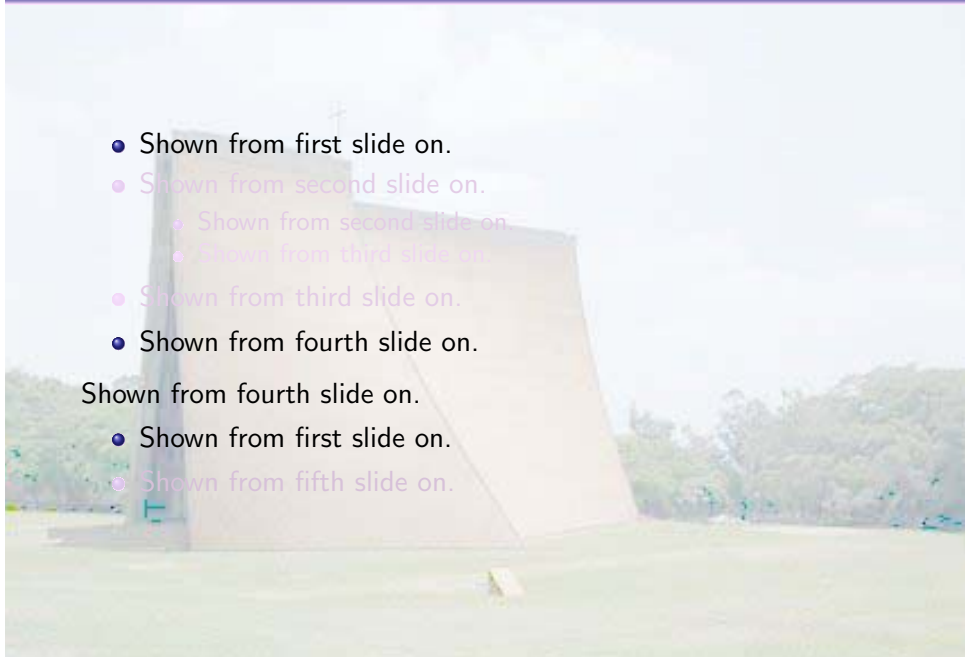
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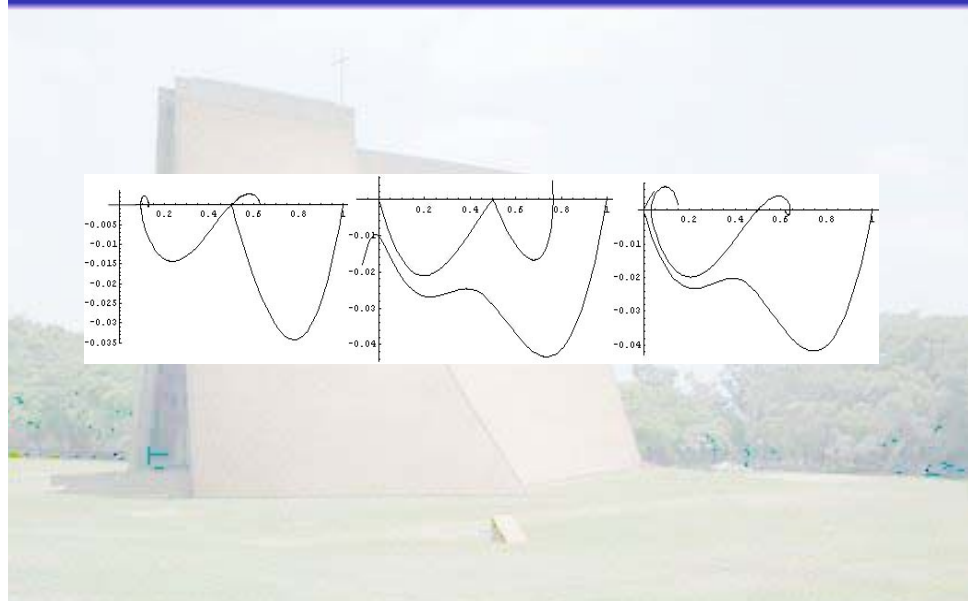


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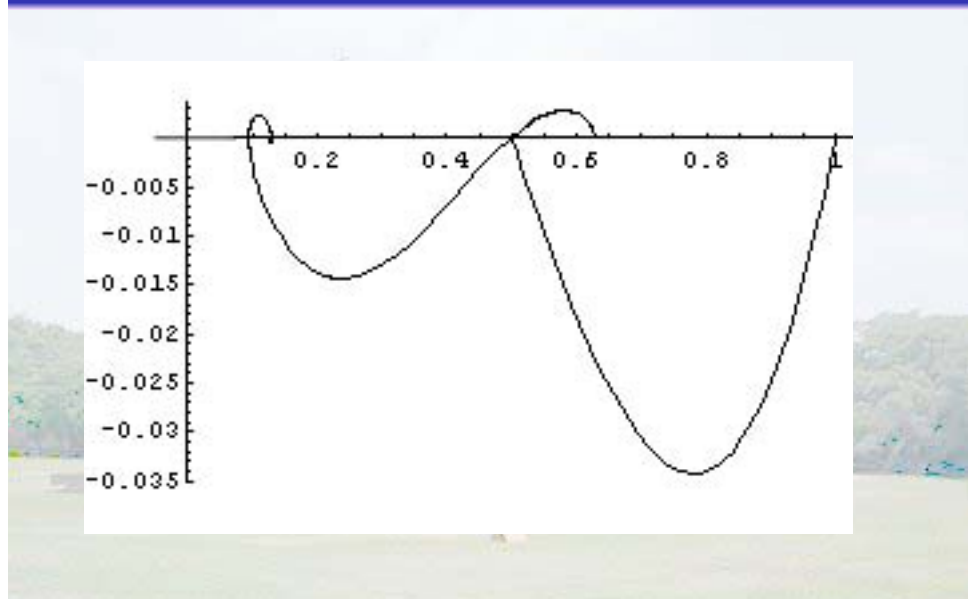
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## 插圖

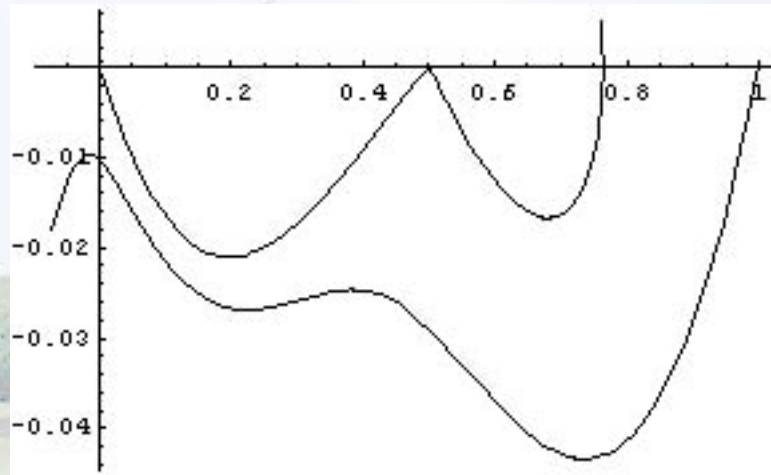


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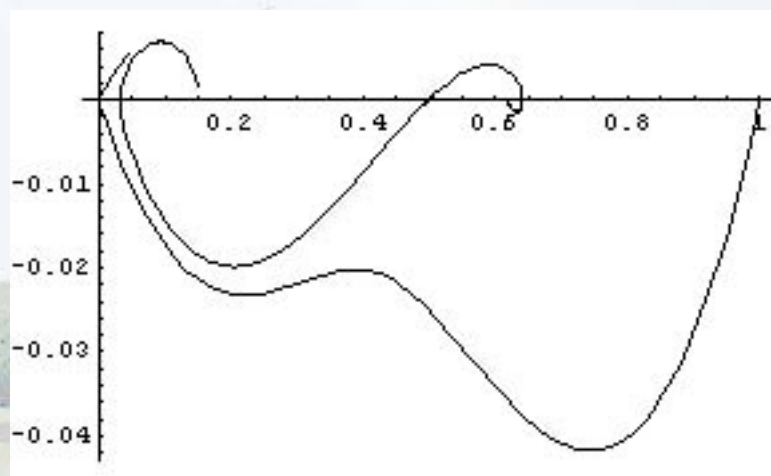


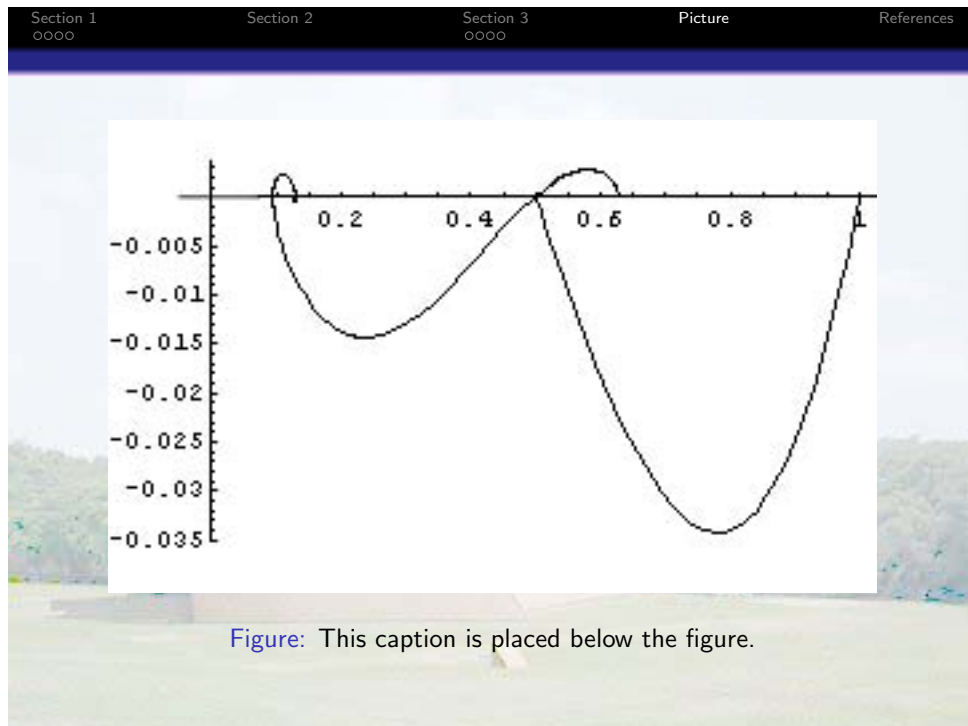


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## 同一標題三張圖分三張投影片





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