

THIS IS A TEST TITLE



THIS IS A TEST SUBTITLE

This is the preface of my notes

Something something

Disclaimer: You can add some cheeky disclaimer just like the real books.

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PART 1

INTRODUCTION TO THE DND PACKAGE

CHAPTER 1: SECTIONING

THIS PACKAGE IS DESIGNED TO AID YOU IN writing beautifully typeset lecture notes in the style of the fifth edition of the world's greatest role playing game, Dungeons and Dragons. It starts by adjusting the section formatting from the defaults in L^AT_EX to something a bit more familiar to the reader. The chapter formatting is displayed above. The start of a chapter will always be on a new page.

1.1 SECTION

Sections break up chapters into large groups of associated text. Most, if not all lectures are going to be taught with chapters separating core topics. Within each topic there are subtopics that can be explained with sections.

SUBSECTION

Subsections further break down the information for the student to understand better.

SUBSUBSECTION

Subsubsections further break down subsection information if they are required. They are the furthest division of text that still have a block header. Below this level headers are displayed in-lined and bolded.

Paragraph. This format is rarely used in the core books, but can be used for other things like descriptions or definitions even though there is dedicated paperbox for definitions.

Sub paragraph. Is a paragraph but with an indent.

All Dungeons and Dragon books have two columns per page. While this is nice if you want a lorefully accurate book, it is painfully difficult to format with PDF slides with a small font.

So notes will mostly be in onecolumn format. You can toggle between twocolumn and onecolumn by having `\twocolumn` or `\onecolumn` in the area you want to change the number of columns. Note: toggling between column format using this method will create a new page.

CHEAT SHEET

Wondrous item, rare

You could use the `\DndItemHeader` to describe what kind of cheat sheet you are allowed to have during an examination.

CHAPTER 2: DND/TEXT BOXES

The dnd package has three environments for setting text apart so it can draw the reader’s attention.

DndSidebar
This is a dnd Sidebar

The DndSidebar is not breakable.

DndComment
This is a DndComment.

The DndComment is breakable and can safely be used inline with the text.

This is a quote, the environment is called DndReadAloud

2.1 TABLES

This is a DndTable, useful in grouping information into a nice small place.

Table head	Table head
some value	some value
some value	some value
some value	some value

CHAPTER 3: MONSTERS AND NPCS

The **DndMonster** environment is useful to describe summative work like midterms, finals, projects, etc.

Assignment

Mental work, neutral evil

Armor Class 10 %

Hit Points 50 marks

Speed 1 week

STR	DEX	CON	INT	WIS	CHA
12 (+1)	8 (-1)	13 (+1)	20 (+5)	20 (+5)	15 (+2)

Damage Vulnerabilities Wolfram Alpha

Damage Immunities Mathematica

Senses

Languages Algebra, Integration, Derivatives

Challenge 1 (200 XP)

COVERAGE

Chapters from 1 to 2

COMPOSITION

Short answer question

CHAPTER 4: COLOURS

These are 8 different colours you can use on DndSidebar, DndComment, DndReadAloud, and dndtables.

Default colour This is the default colour called PhbLightGreen
PhbLightCyan This colour is called PhbLightCyan
PhbMauve This colour is called PhbMauve
PhbTan This colour is called PhbTan
DmgLavender This colour is called DmgLavender
DmgCoral This colour is called DmgCoral
DmgSlateGray This colour is called DmgSlateGray
DmgLilac This colour is called DmgLilac

PART 2

INTRODUCTION TO THE DNDNOTES PACKAGE

CHAPTER 5: INTRODUCTION

The dndnotes package is my collection of user-defined environments and macros to typeset core concepts in a neat way. It requires the dnd package as it creates dndSidebar boxes for definitions, theorems, corollaries, and others. It also provides useful commands for taking notes using the Cornell Method.

CHAPTER 6: ENVIRONMENTS

6.1 DEFINITIONS

Here is an example of a Definition environment from the second edition of the Dragon book.

Definition 6.1.1. Three-Address Instruction

Is a sequence of instructions of the form

$$x = y \textbf{op} z$$

*where x , y , and z are names, constants, or compiler-generated temporaries. The **op** stands for operator.*

They are labelled based on the chapter then section then the definition count. The Definition environment also requires a title.

Here it is in verbatim

```
\begin{Definition}{Three-Address Instruction}
  Is a sequence of instructions of the form
  \[ x = y \textbf{op} z \]
  where  $x$ ,  $y$ , and  $z$  are names, constants,
  or compiler-generated temporaries.
  The  $\textbf{op}$  stands for operator.
\end{Definition}
```

6.2 THEOREM

Here is an example of a Theorem environment

Theorem 6.2.1. Nyquist-Shannon Sampling theorem

If a function $f(t)$ contains no frequencies higher than B hertz, it is completely determined by giving its ordinates at a series of points spaced $\frac{1}{2B}$ seconds apart.

Like the Definition environment the numbering is based on the chapter then section then the theorem count, it also requires a title

Here it is in verbatim

```
\begin{Theorem}{Nyquist-Shannon Sampling theorem}
  If a function  $f(t)$  contains no frequencies higher than  $B$  hertz,
  it is completely determined by giving its ordinates at a series of
  points spaced  $\frac{1}{2B}$  seconds apart.
\end{Theorem}
```

6.3 COROLLARY

Here is an example of a Corollary environment

Corollary 6.3.0.1. *There's no right rectangle whose sides measure 3cm, 4cm, and 6cm.*

Unlike the Definition and Theorem environment it does not require a title. Moreover, it has one additional level of indexing where before the corollary count but after the section count there is a subsection count as well.

Here it is in verbatim

```
\begin{Corollary}
  There's no right rectangle whose sides measure 3cm, 4cm, and 6cm.
\end{Corollary}
```


6.4 LEMMA

Here is an example of a Lemma environment

Lemma 6.4.1. *Given two line segments whose lengths are a and b respectively there is a real number r such that $b = ra$.*

The Lemma environment does not require a title. It also follows the numbering scheme of the Definition and Theorem except it follows the lemma count.

Here it is in verbatim

```
\begin{Lemma}
  Given two line segments whose lengths are  $a$  and  $b$  respectively there is a real number  $r$  such that
\end{Lemma}
```

6.5 REMARK

Remark. *This statement is true, I guess.*

The Remark environment is an unnumbered theorem-like environment

Here it is in verbatim

```
\begin{Remark}
  This statement is true, I guess.
\end{Remark}
```

6.6 REVIEW

The Review environment is useful to highlight core concept to review before moving on.

Review

Remember to set the secnumdepth to 0 if you want to remove the numerical indexing at the section level but want to keep it at the chapter level.

Here it is in verbatim

```
\begin{Review}
  Remember to set the secnumdepth to 0 if you want to remove the numerical indexing at the section level
\end{Review}
```

6.7 NOTE

The Note environment is useful to highlight exceptions, notes, or whatever.

Note

Remember to set the secnumdepth to 0 if you want to remove the numerical indexing at the section level but want to keep it at the chapter level.

Here it is in verbatim

```
\begin{Note}
  Remember to set the secnumdepth to 0 if you want to remove the numerical indexing at the section level
\end{Note}
```

6.8 QUESTIONS

The Question environment is an enumerated DndComment environment designed to list questions provided by the instructor for students to answer.

Question(s)

1. What is the difference between a compiler and an interpreter?
2. Solve y for this equation $y = 3 + 3^2 \times 20$?
3. What is

$$\int \cos(x) dx ?$$

Here it is in verbatim

```
\begin{Questions}
  \item What is the difference between a compiler and an interpreter?
  \item Solve  $y$  for this equation  $y = 3 + 3^2 \times 20$  ?
  \item What is  $\int \cos(x) dx$  ?
\end{Questions}
```

6.9 ANSWERS

The Answer environment is an enumerated DndComment environment designed to answer the listed questions from the preceding Question environment.

Answer(s)

1. A compiler takes in the source program and converts it to a target program, you have to run the target program separately. While an interpreter directly executes the operations specified in the source program on inputs supplied by the user.
2. $y = 183$.
- 3.

$$\sin(x) + C$$

Here it is in verbatim

```
\begin{Answers}
  \item A compiler takes in the source program and converts it to a target program,
  you have to run the target program separately. While an interpreter directly executes the
  operations specified in the source program on inputs supplied by the user.
  \item  $y = 183$ .
  \item  $\sin(x) + C$ 
\end{Answers}
```

6.10 PROOF

The dndnotes package includes the amsthm package which means you can use the proof environment.

Here is an example with a lemma previously described.

Lemma 6.10.1. *Given two line segments whose lengths are a and b respectively there is a real number r such that $b = ra$.*

Proof. To prove it by contradiction try and assume that the statement is false, proceed from there and at some point you will arrive to a contradiction. \square

CHAPTER 7: CORNELL NOTES

7.1 CUES

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque.

This is a cue useful in getting ideas

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat.

7.2 UNSURE

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis.

Ask the instructor to make sure you understand the concept correctly

Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna.

7.3 INFO

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit.

For further informative measures

Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna.

7.4 IMPROVE

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst.

If you need to improve something later

Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim.

CHAPTER 8: MINTED CODE EXAMPLES

Here are some minted code examples using the minted packaged included by the dndnotes package.

Note

This requires Pygments to be installed on the system and have the `-escape-shell` flag be enabled.

8.1 PYTHON

```
1 print("Hello World!")
```

Listing 1: Hello World in Python

8.2 C

```
1 printf("Hello world!\n");
```

Listing 2: Hello World in C

8.3 ASM

```
1 .file      "hello.c"
2          .text
3          .section      .rodata
4 .LC0:
5          .string      "Hello World"
6          .text
7          .globl      main
8          .type        main, @function
9 main:
10 .LFBO:
11          .cfi_startproc
12          pushq      %rbp
13          .cfi_def_cfa_offset 16
14          .cfi_offset 6, -16
15          movq      %rsp, %rbp
16          .cfi_def_cfa_register 6
17          leaq      .LC0(%rip), %rdi
18          call      puts@PLT
19          movl      $0, %eax
20          popq      %rbp
21          .cfi_def_cfa 7, 8
22          ret
23          .cfi_endproc
```

Listing 3: Hello World in x86

CHAPTER 9: CALCULUS

9.1 DERIVATIVES

Definition 9.1.1. Derivative

Let a function $f(x)$ be defined on an open interval $I = (a, b)$. The function $f(x)$ is differential at x_0 in I if the following limit exists

$$f'(x) = \lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0}$$

An equivalent formula is derived if we take $x - x_0 = h$

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}$$

9.2 INTEGRATION

Definition 9.2.1. Riemann Sum

Let $y = f(x)$ and $a \leq x \leq b$ is a continuous function. The area under the curve of the function is calculated by the formula

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n f(x_k) \Delta x$$

where $\Delta x = \frac{b-a}{n}$, and $x_k = a + k\Delta x$.

9.3 APPLICATION OF CALCULUS VOLUME

Definition 9.3.1. Volume

To find the volume of a curve about the x axis use this equation below

$$V = \int_a^b \pi y^2 dx$$

To find the volume of a curve about the y axis use this equation below

$$V = \int_a^b \pi x^2 dx$$

Definition 9.3.2. General Formula

Here is the general formula

$$V = V_o - V_i = \int_a^b f(x) dx - \int_a^b g(x) dx$$

Variable	What they mean
----------	----------------

$f(x)$	is the function that encompasses $g(x)$
--------	-----------------------------------------

$g(x)$	is the function that encompasses the hollowed out cylinder
--------	------------------------------------------------------------

CHAPTER 10: LINEAR ALGEBRA

10.1 MATRIX

A matrix is a rectangular array of numbers like this

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Or more generally like this

$$\begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix}$$

Identity matrix

$$\begin{bmatrix} 1 & 0 & \dots & 0 \\ 0 & 1 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Here is a 5 by 5 identity matrix

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

Here is a column vector

$$\begin{pmatrix} x_1 \\ \vdots \\ x_n \end{pmatrix}$$

CHAPTER 11: GRAPH

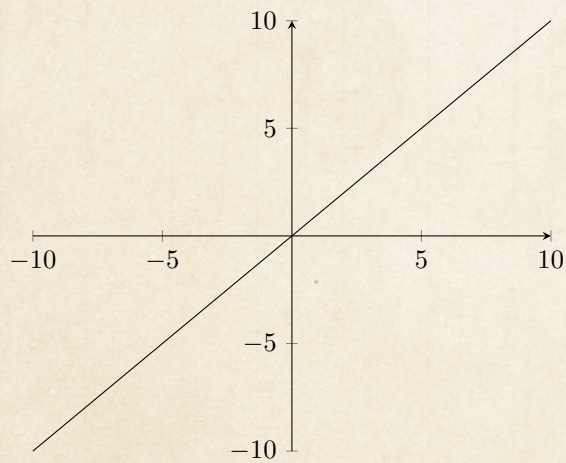


Figure 11.1: Line

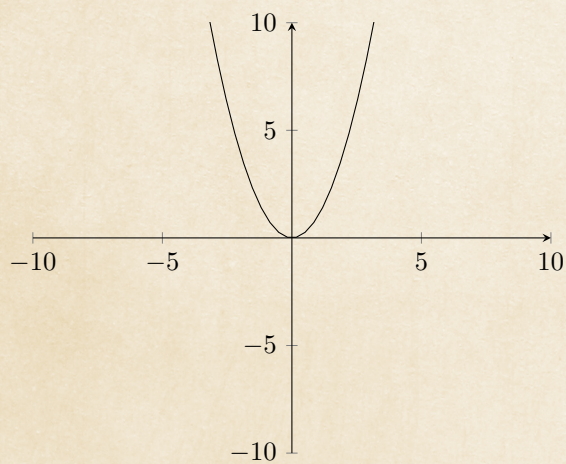


Figure 11.2: Second order polynomial

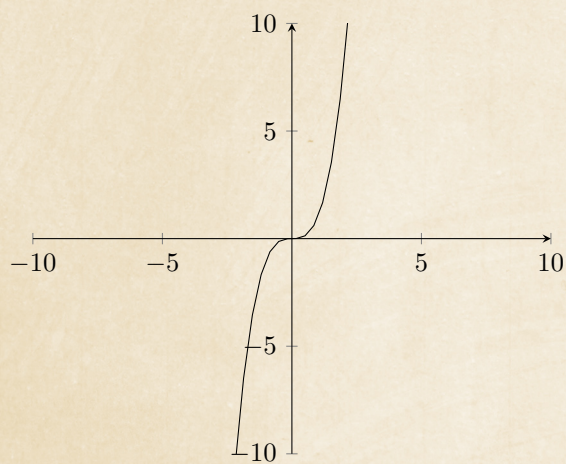


Figure 11.3: Third order polynomial

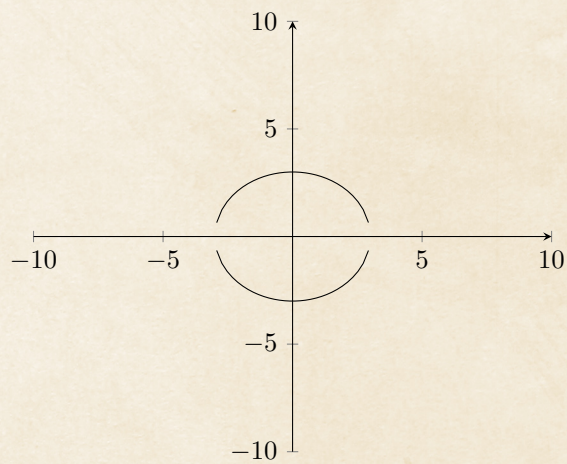


Figure 11.4: circle

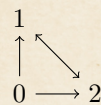


Figure 11.5: Graph Test