

MAS115: WEEK 5 LAB

SAM MARSH

CONTENTS

1. Further L ^A T _E X features	1
2. Aligned equations	1
3. Tables	2
4. Inserting computer code	2

1. FURTHER L^AT_EX FEATURES

- (1) This is the L^AT_EX logo.
- (2) Let

$$x = u + v \quad \text{and} \quad y = u - v.$$

- (3) This will display
- (4) This will make text `computery`.
- (5) `bbc.co.uk/index_1.htm`
- (6) Gödel created a true yet unprovable mathematical statement¹.
- (7) Let's switch to inline maths: $x^2 = 1$ and display-math:

$$x^2 = 1$$

using an alternative method.

- (8) The symbol for the real numbers is \mathbb{R} .

2. ALIGNED EQUATIONS

Since $e^{it} = \cos t + i \sin t$, it follows that

$$\begin{aligned}(\cos t + i \sin t)^n &= (e^{it})^n \\ &= e^{int} \\ &= \cos(nt) + i \sin(nt).\end{aligned}$$

¹See Wikipedia for more details.

3. TABLES

There are some good pale ales in Sheffield.

Name	Brewery	Strength
Pale Rider	Kelham Island	4.3%
Moonshine	Abbeydale	3.6%

Some common functions differentiate as shown in the table.

$f(x)$	$f'(x)$
x^2	$2x$
e^x	e^x
$\tan x$	$\sec^2 x$

4. INSERTING COMPUTER CODE

The code below is an implementation of the ‘Higher and Lower’ game.

```

1  # an implementation of the game of higher or lower
2
3  from random import randint
4
5  number = randint(1,100)
6
7  print "Higher or lower? Try to guess the number I've thought of
   between 1 and 100."
8
9  attempts = 0
10 guess = 0
11
12 while guess != number :
13     attempts += 1
14
15     if attempts > 7 :
16         print "Hurry up!"
17
18     attempt_number = str(attempts)
19     guess = input("Guess "+attempt_number+": ")
20
21     if guess > number :
22         print guess,"is too high"
23     elif guess < number :
24         print guess,"is too low"
25
26 print "Correct! The answer was",guess
27 print "You took",attempts,"attempts."
28
29 if attempts > 8 and attempts < 11 :
30     print "Too slow for my liking!"
31 elif attempts > 10 :
32     print "Were you even trying?"

```