

# MAS115: WEEK 5 LAB

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### 1. FURTHER L<sup>A</sup>T<sub>E</sub>X FEATURES

- (1) This is the L<sup>A</sup>T<sub>E</sub>X logo.
- (2) Let

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

- (3) This will display
- (4) This will make text `computery`.
- (5) `http://bbc.co.uk/index\_1.htm`
- (6) Here's the BBC website.
- (7) `\begin{document}`
- (8) Gödel created a true yet unprovable mathematical statement<sup>1</sup>.
- (9) Let's switch to inline maths:  $x^2 = 1$  and `display-math`:

$$x^2 = 1$$

using an alternative method.

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

### 2. ALIGNED EQUATIONS

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

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

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<sup>1</sup>See 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()
8  print("Higher or lower?")
9  print("_____")
10 print()
11 print("Try to guess the number I've thought of between 1 and
    100.")
12
13 attempts = 0
14 guess = 0
15
16 while guess != number:
17     attempts += 1
18
19     if attempts > 7:
20         print("Hurry up!")
21
22     attempt_number = str(attempts)
23     guess = int(input("Guess "+attempt_number+": "))
24
25     if guess > number:
26         print(guess, "is too high")
27     elif guess < number:
28         print(guess, "is too low")
29
30 print("Correct! The answer was", guess)
31 print("You took", attempts, "attempts.")
32
33 if attempts > 8 and attempts < 11:
34     print("Too slow for my liking!")

```

```
35 elif attempts > 10:  
36     print("Were you even trying?")
```