

# Exam Briefing 2016

*Or Everything you need to know about the exams other than the questions*

# Introduction

- *Who am I?*

**Chris Hadley:** Clerk to the Examiners in 1A (among many other things)

# Introduction

- *Who am I?*

**Chris Hadley:** Clerk to the Examiners in 1A (among many other things)

- *Why are we here?*

To try and make the whole process a bit less scary

# Introduction

- *Who am I?*

**Chris Hadley:** Clerk to the Examiners in 1A (among many other things)

- *Why are we here?*

To try and make the whole process a bit less scary

- *Who are you?*

- |                                 |                       |
|---------------------------------|-----------------------|
| • 73 Computer Science & NST     | <b>Papers 1&amp;2</b> |
| • 7 Computer Science & SocPsych | <b>Papers 1&amp;2</b> |
| • 9 Computer Science & Maths    | <b>Papers 1&amp;2</b> |
| • 53 NST                        | <b>Paper 1 only</b>   |

# Practical Matters – When?

## Computer Science Tripos, Part IA, 2016 - CST0

|                  |             |        |   |   |
|------------------|-------------|--------|---|---|
| Thursday 26 May  | 09.00-12.00 | MAT0/1 | Mathematics Paper 1 (MAT0 Paper 1)  | Mill Lane Lecture-rooms                       |
| Friday 27 May    | 13.30-16.30 | MAT0/2 | Mathematics Paper 2 (MAT0 Paper 2)  | Mill Lane Lecture-rooms                       |
| Monday 30 May    | 13.30-16.30 | 1      | Computer science Paper 1  | Corn Exchange                                 |
| Tuesday 31 May   | 13.30-16.30 | 2      | Computer science Paper 2  | Corn Exchange                                 |
| Wednesday 01 Jun | 09.00-12.00 | PHO/1  | Physiology of Organisms (from NST0) (Written paper)   | Corn Exchange                                 |
| Thursday 02 Jun  | 10.00-17.00 | EART/P | Earth Sciences (from NST0) (Practical examination)<br>(Details will be posted on the Department Notice Board) | Department of Earth Sciences                  |
| Friday 03 Jun    | 09.00-12.00 | PST1/3 | Introduction to psychology (HPT1 PBS1)  | Sports Hall, Cambridge Sports Centre          |
| Saturday 04 Jun  | 13.30-16.30 | PSIC/1 | Physics (from NST0) (Written paper)   | Sports Hall, Cambridge Sports Centre          |
| Monday 06 Jun    | 09.00-12.00 | MATH/1 | Mathematics (from NST0) (Written paper 1)   | Sports Centre Studio, Cambridge Sports Centre |
| Monday 06 Jun    | 13.30-16.30 | CHEM/1 | Chemistry (from NST0) (Written paper)   | Sports Hall, Cambridge Sports Centre          |
| Tuesday 07 Jun   | 09.00-12.00 | EART/1 | Earth Sciences (from NST0) (Written paper)  | Sports Hall, Cambridge Sports Centre          |
| Tuesday 07 Jun   | 13.30-16.30 | EAB/1  | Evolution and Behaviour (from NST0) (Written paper)   | Sports Hall, Cambridge Sports Centre          |
| Wednesday 08 Jun | 09.00-12.00 | MATH/2 | Mathematics (from NST0) (Written paper 2)   | Sports Centre Studio, Cambridge Sports Centre |

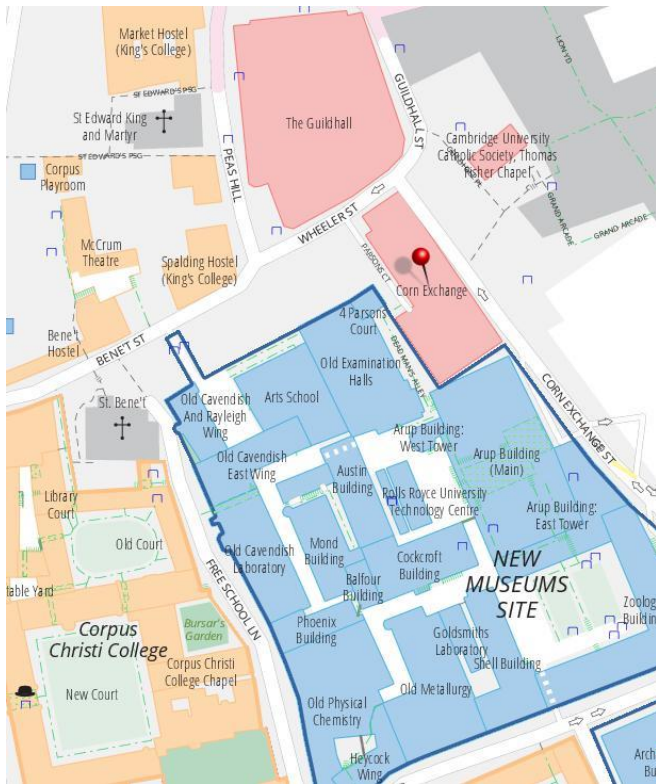
Note that this timetable is for CST only, venues may be different for others.

This should have been sent to you on your examination confirmation form (yellow card)

It's at:  
[www.cambridgestudents.cam.ac.uk/your-course/examinations/all-students-timetable](http://www.cambridgestudents.cam.ac.uk/your-course/examinations/all-students-timetable)

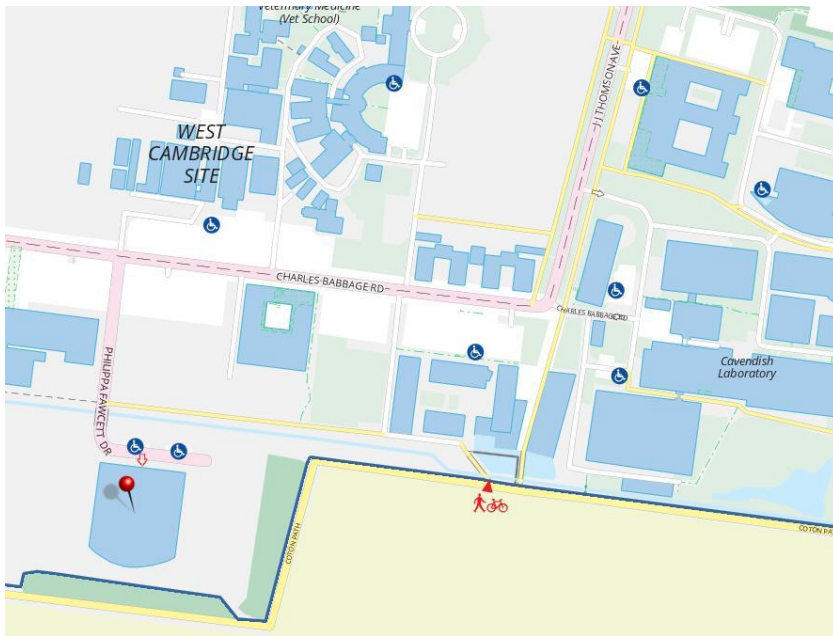
# Practical Matters – Where?

- Where? Papers 1 and 2 = Corn Exchange



# Practical Matters – Where?

- Where? Most other papers – Sports Centre



# Practical Matters – What?

UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY

## Part IA: Structure of Papers 1 and 2 in 2016

### Paper 1

#### Section A

*Attempt 1 question*

1. Foundations of Computer Science
2. Foundations of Computer Science

#### Section B

*Attempt 1 question*

3. Object-Oriented Programming
4. Object-Oriented Programming

#### Section C

*Attempt 1 question*

5. Numerical Methods
6. Numerical Methods

#### Section D

*Attempt 2 questions*

7. Algorithms
8. Algorithms
9. Algorithms
10. Algorithms

*Attempt five questions on each paper.*

### Paper 2

#### Section A

*Attempt 1 question*

1. Digital Electronics
2. Digital Electronics

#### Section B

*Attempt 1 question*

3. Operating Systems
4. Operating Systems

#### Section C

*Attempt 1 question*

5. Software and Interface Design
6. Software and Interface Design

#### Section D

*Attempt 2 questions*

7. Discrete Mathematics
8. Discrete Mathematics
9. Discrete Mathematics
10. Discrete Mathematics

Students reading Part IA of the Computer Science Tripos take both Paper 1 and Paper 2.

Students reading the Computer Science option in Part IA of the Natural Sciences Tripos take only Paper 1.

Students reading the Introduction to Computer Science option in Part I of the Psychological and Behavioural Sciences Tripos take only Paper 1.



# Practical Matters – Who's who?

- Supervisor
- Invigilators & Assistants
- Examiners – only present for 1<sup>st</sup> 30mins, but you can ask questions after that.
- Proctor (rare)
- (not in the room) Assessors

# Practical Matters – Things to take with you

- Id

# Practical Matters – Things to take with you

- Id
- Clothes

# Practical Matters – Things to take with you

- Id
- Clothes
  - 11. Candidates shall be dressed decently and not in a manner that is likely to create a disturbance in the examination room, or to distract the attention of other candidates.
- Anything else?

# Practical Matters – Things *NOT* to take with you

- Mobile phone

# Practical Matters – Things *NOT* to take with you

- Mobile phone - £50 fine !

- Food

4. A candidate may take a small screw-top bottle of water to his or her desk for consumption during an examination session provided that no disturbance is thereby caused to other candidates. Except with the written consent of the Secretary of the Board of Examinations no other items of food or drink may be taken into an examination room. A Supervisor, Invigilator, or Examiner has authority to deprive a candidate of unauthorized items until the examination session is ended.

# Practical Matters – Things *NOT* to take with you

- Mobile phone - £50 fine !

- Food

4. A candidate may take a small screw-top bottle of water to his or her desk for consumption during an examination session provided that no disturbance is thereby caused to other candidates. Except with the written consent of the Secretary of the Board of Examinations no other items of food or drink may be taken into an examination room. A Supervisor, Invigilator, or Examiner has authority to deprive a candidate of unauthorized items until the examination session is ended.

- Books or papers
- Any means of data storage or retrieval
- Any radio or audio equipment

# Practical Matters - Calculators

- You are allowed to take a calculator into
  - Computer Science papers 1 & 2
  - All NatSci papers (except Maths)
  - All Politics, Psychology, and Sociology papers
- You are **NOT** allowed to take a calculator into
  - Any NatSci Maths papers
  - Any papers borrowed from the Mathematical Tripos
- Approved calculators must be marked by the Department
- Only the following will be approved: Casio fx 991, fx 115, fx 570 (any versions)

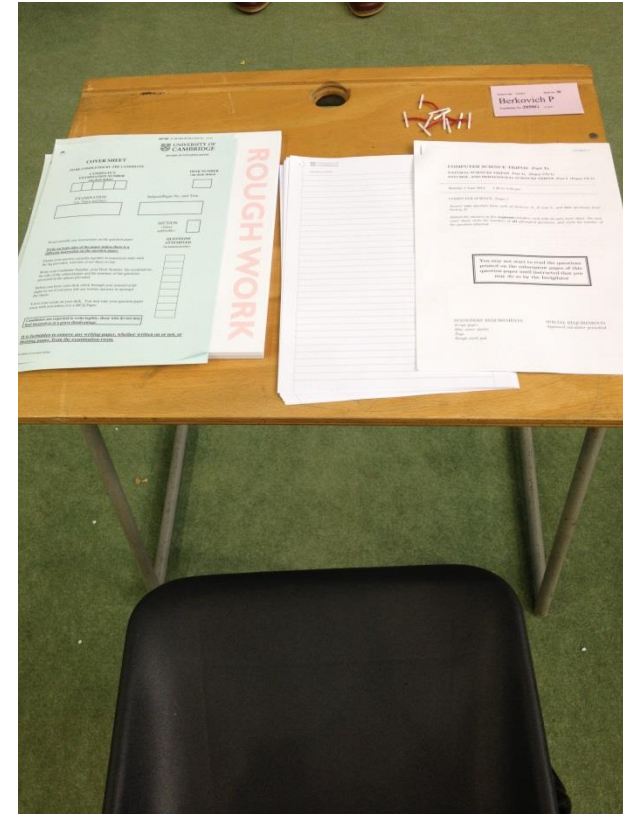


# Practical Matters – what happens when

- Aim to be outside 30-15 mins early. You may be admitted before the advertised time. (You will be allowed in up to 30 mins late)
- You will only see the exam cover. An invigilator will tell you when you can open the exam paper and start.
- You should read the whole paper before you start writing.
- Allow roughly 36mins per question ( $180 \div 5$ )
- There will be a 5 minute warning before the end of the exam
- You must stop writing when instructed at the end of the exam.
- You may then fill in the cover sheet (if you haven't already).
- You may leave once your paper is collected. (You may leave earlier but not in the first 30 mins)

# Practical Matters – the desk

- On your desk will be:
  - The exam paper
  - A stock of writing paper
  - A stock of clearly marked rough working paper (probably!)
  - A card with your name and examination number, and the number of your desk
  - Some cover sheets
  - Some tags



# Practical Matters – the cover of the paper

CST.2012.1.1

COMPUTER SCIENCE TRIPOS Part IA

NATURAL SCIENCES TRIPOS Part IA (Paper CS/1)

POLITICS, PSYCHOLOGY, AND SOCIOLOGY TRIPOS Part I (Paper 9)

---

Monday 4 June 2012 1.30 to 4.30

---

COMPUTER SCIENCE Paper 1

*Answer **five** questions.*

*At least **one** question from each section is to be answered.*

*Submit the answers in five **separate** bundles, each with its own cover sheet. On each cover sheet, write the numbers of **all** attempted questions, and circle the number of the question attached.*

**You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator**

# Practical Matters – Cover sheet



## COVER SHEET TO BE COMPLETED BY THE CANDIDATE

CANDIDATE'S  
EXAMINATION NUMBER  
(on desk ticket)

|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | X |
|---|---|---|---|---|

DESK  
NUMBER  
(on desk ticket)

|     |
|-----|
| 100 |
|-----|

EXAMINATION  
(e.g. Tripos and Part)

|                     |
|---------------------|
| Computer Science IA |
|---------------------|

Subject/Paper No. and Title

|         |
|---------|
| Paper 1 |
|---------|

SECTION  
(where applicable)

|   |
|---|
| A |
|---|

Read carefully any instructions on the question paper.

**Write on both sides of the paper unless there is a different instruction on the question paper.**

Fasten your answers securely together in numerical order with the tag provided, with this cover-sheet on top.

Write your Candidate Number, your Desk Number, the examination, the title of the subject/paper and the numbers of the questions answered in the spaces provided.

Before you leave your desk check through your unused script paper to see if you have left any written answers in amongst the sheets.

Leave your script on your desk. You may take your question paper away unless it is a MCQ Paper.

Candidates are expected to write legibly; those who do not may find themselves at a grave disadvantage

**It is forbidden to remove any writing-paper, whether written on or not, or blotting paper, from the examination-room.**

QUESTIONS  
ATTEMPTED  
(in numerical order)

|   |
|---|
| ① |
| 3 |
| 5 |
| 7 |
| 9 |
|   |
|   |
|   |
|   |

# Practical Matters – Cover sheet

Some people find the cover sheet confusing because the instructions telling you how to fill it in are on the front of the exam paper, NOT on the cover sheet itself. This is because all exams use the same cover sheet, and some subjects want them filled in differently.

To emphasise – **We want a cover sheet per question** (ie 5)

We **do not** want a cover sheet per paper (ie 1), or a cover sheet per section (ie 4)

Please fill in the numbers of *all questions attempted* on **all** cover sheets. This is so we can tell if a question answer gets lost!

**Please write numbers legibly on the cover sheet**

Also – **don't write your name on your answers or on the cover sheet - candidate number only** (we use anonymous marking)

# Practical Matters – Illness/incapacity/mitigating circumstances

- If a problem occurs in the time before the exams that is likely to disturb your revision or performance in the exam itself **tell your Tutor asap.**
  - Your college may submit a “warning letter”
  - The letter will be used as evidence if you apply for an allowance. (Allowances are too complicated to deal with here – your Tutor will tell you what you need to know)
  - If it is a medical matter see a GP as the GP may be asked to provide a note
- If a problem occurs on the day **contact your college Porters’ Lodge.**
- If a problem occurs in the exam hall put your hand up and **inform an invigilator.**

# After the exam – What happens?

- Sorting
- Marking
- Checking
- Practical marks

# After the exam – Practical marks

Most (or all) of you have gained the full set of ticks – 20 ticks for CompScis, 10 ticks for others.

So for CompScis that's 10 ticks allocated to Paper 1 and 10 to Paper 2 (and obviously just 10 to Paper 1 for non-CompScis).

2 marks per tick = 20 marks per paper.

You also have up to 100 marks from the written paper giving a possible total of 120.

We prefer a mark out of 100, so we scale the written paper marks by 0.8:

$$M = (W \times 0.8) + P$$



# After the exam - Norm referencing

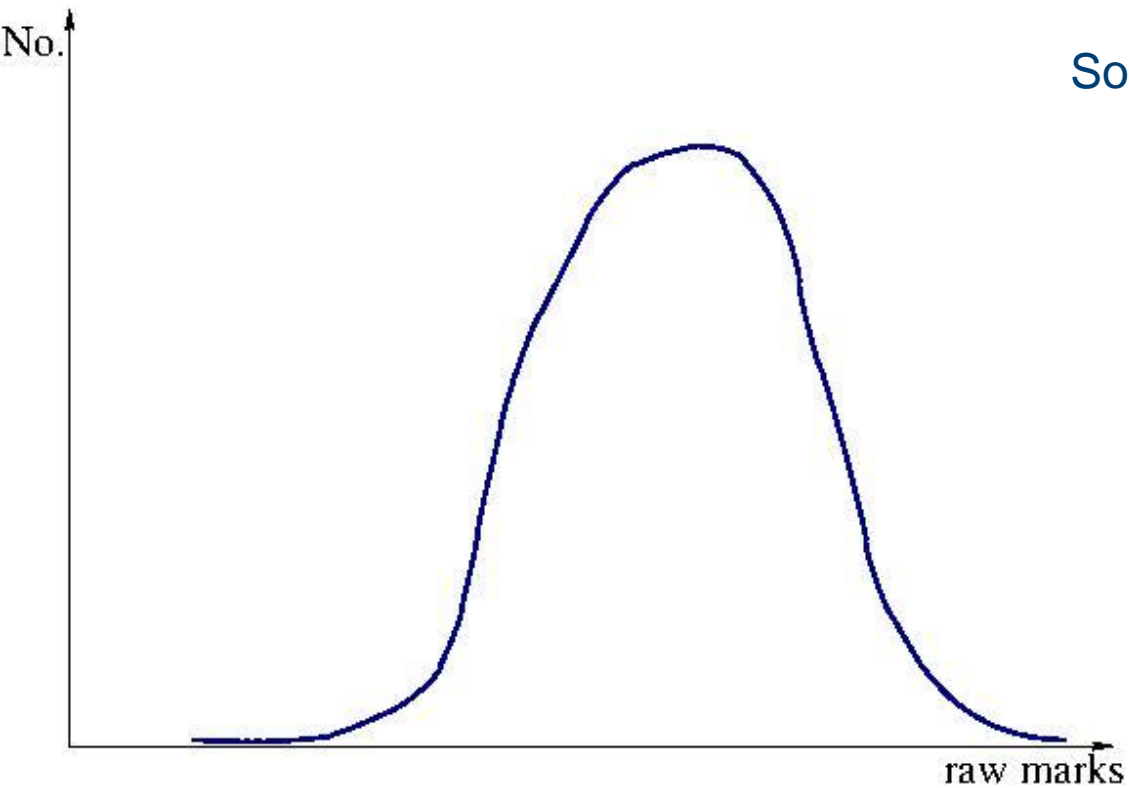
A problem: We need to add up the marks on your various papers.

So what's the problem – can't we just add up the raw marks?

Yes – but it wouldn't be fair.

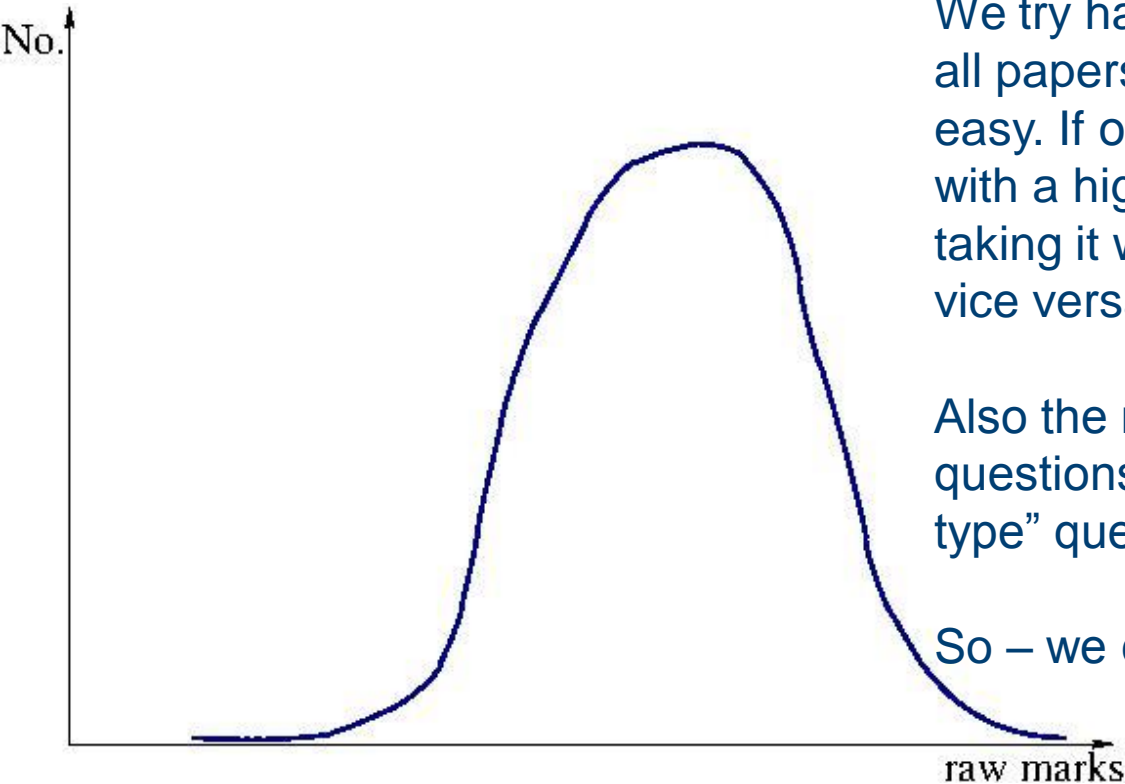
Let's look at the mark distribution for the whole cohort for a random paper

# After the exam - Norm referencing



Some distribution a bit like this

# After the exam - Norm referencing

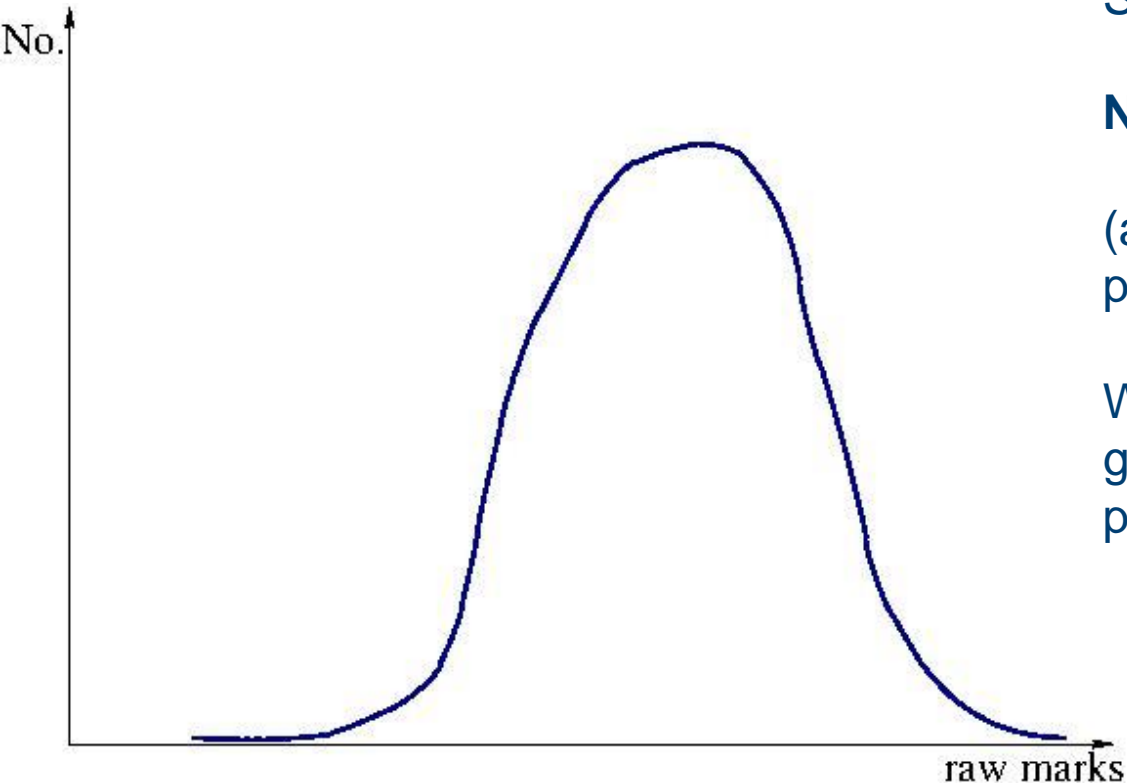


We try hard to make all questions and thus all papers equally difficult, but this is not easy. If one paper turned out to be “easier”, with a higher overall distribution, the people taking it would be unfairly advantaged (and vice versa).

Also the mark distribution for “essay-type” questions tends to be different from “maths-type” questions.

So – we can’t just add up the raw marks

# After the exam - Norm referencing



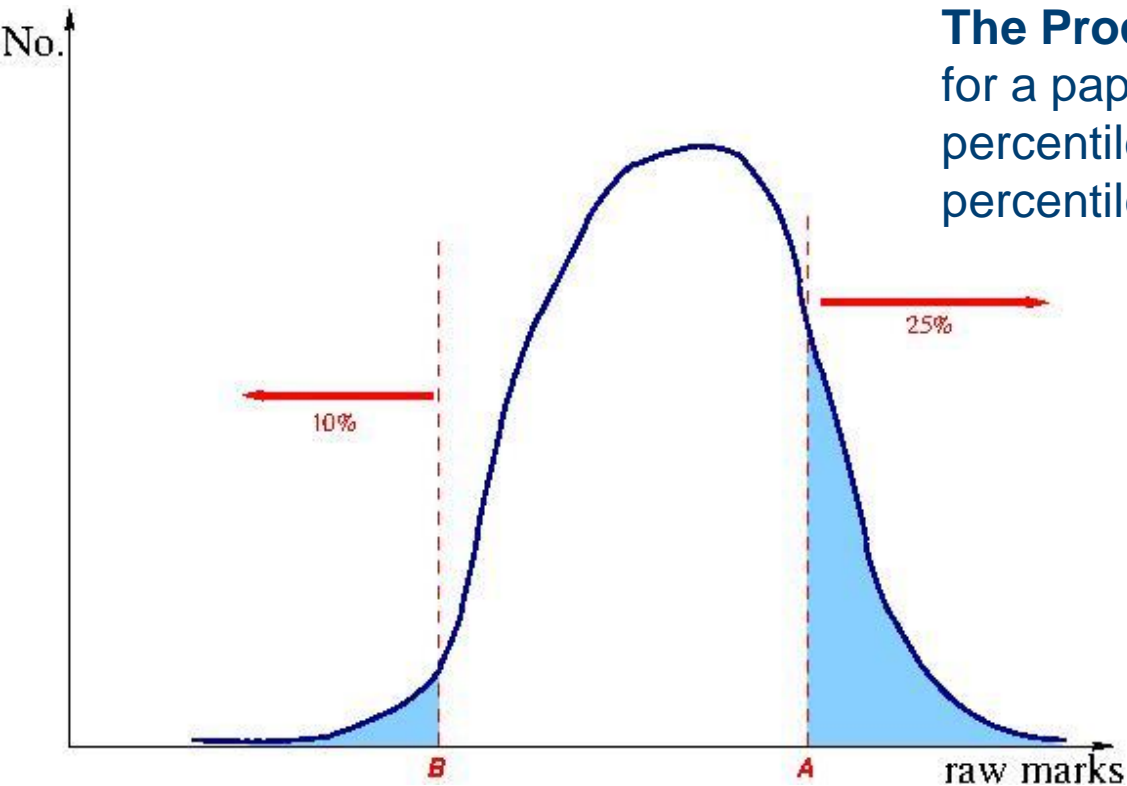
So what can we do about it?

**Normalise the paper marks**

(aka norm referencing, aka linear piecewise scaling)

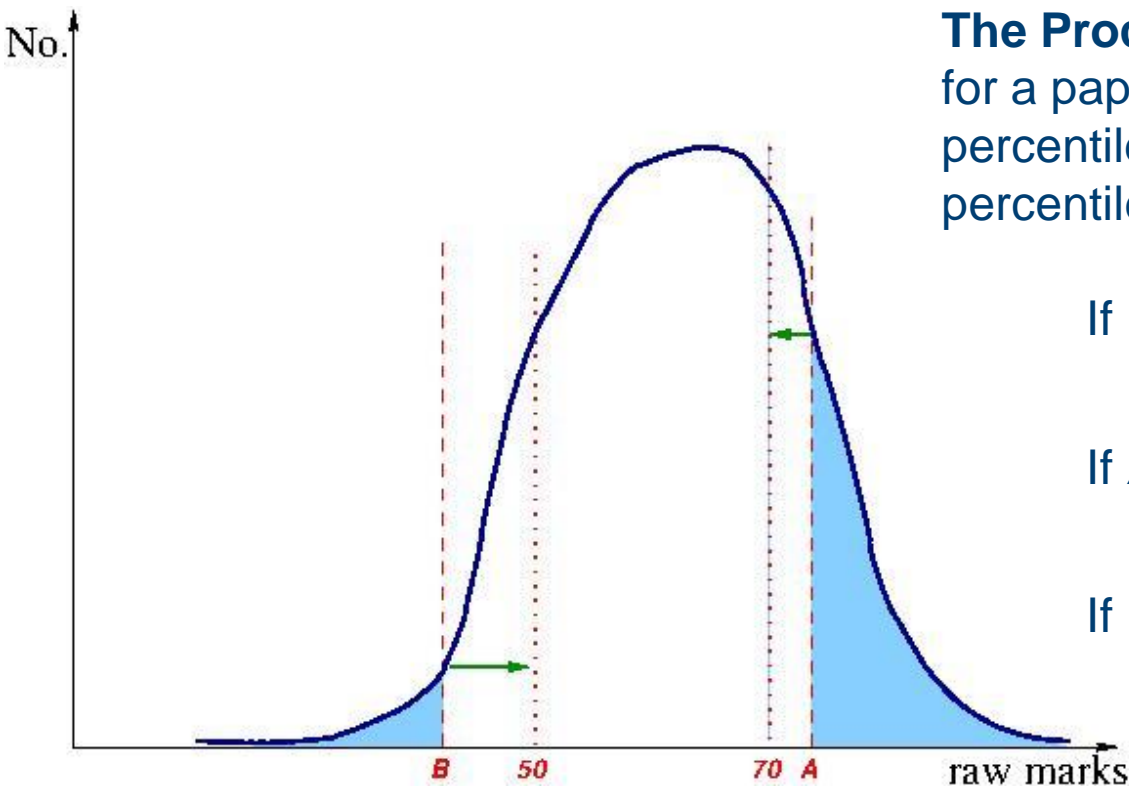
We **decree** that 25% of people **must** get 70 marks or above, and 90% of people **must** get 50 marks or above

# After the exam - Norm referencing



**The Procedure:** From the full set of marks for a paper determine the mark at the 25<sup>th</sup> percentile, *A*, and the mark at the 90<sup>th</sup> percentile, *B*.

# After the exam - Norm referencing



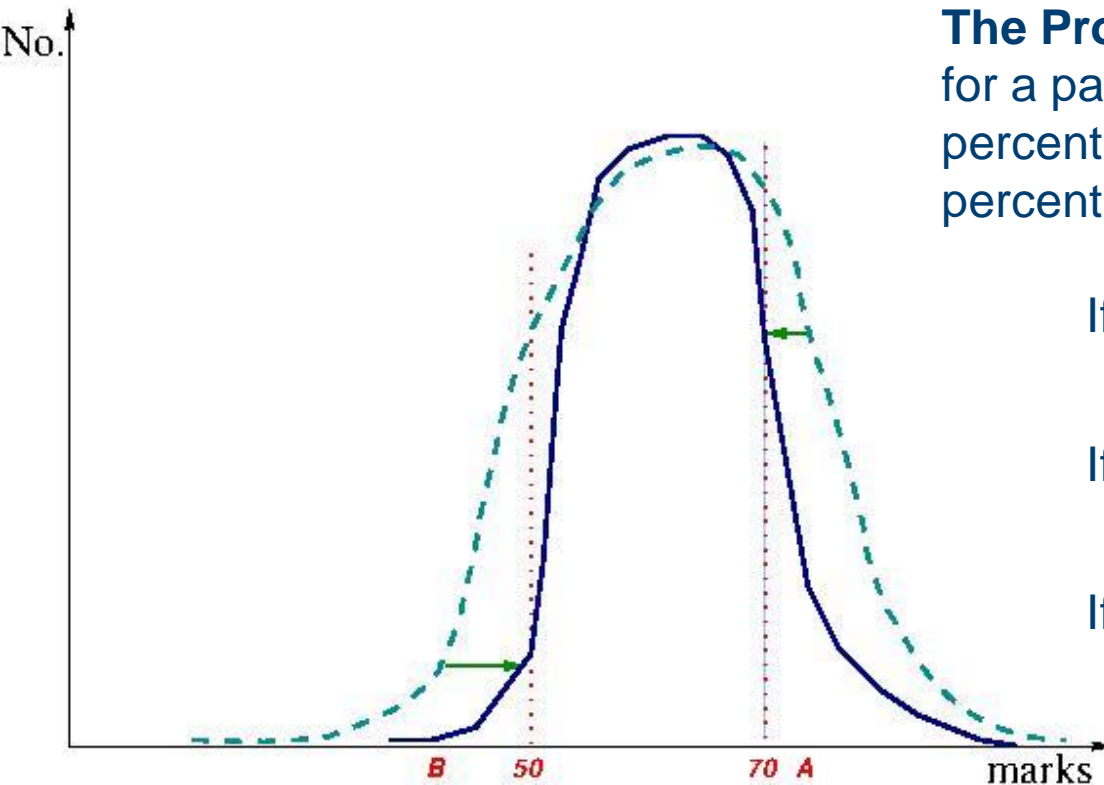
**The Procedure:** From the full set of marks for a paper determine the mark at the 25<sup>th</sup> percentile,  $A$ , and the mark at the 90<sup>th</sup> percentile,  $B$ .

$$\text{If } x \geq A: \quad x := 70 + \frac{30(x - A)}{(100 - A)}$$

$$\text{If } A > x \geq B: \quad x := 50 + \frac{20(x - B)}{(A - B)}$$

$$\text{If } B > x \geq 0: \quad x := \frac{50x}{B}$$

# After the exam - Norm referencing



**The Procedure:** From the full set of marks for a paper determine the mark at the 25<sup>th</sup> percentile,  $A$ , and the mark at the 90<sup>th</sup> percentile,  $B$ .

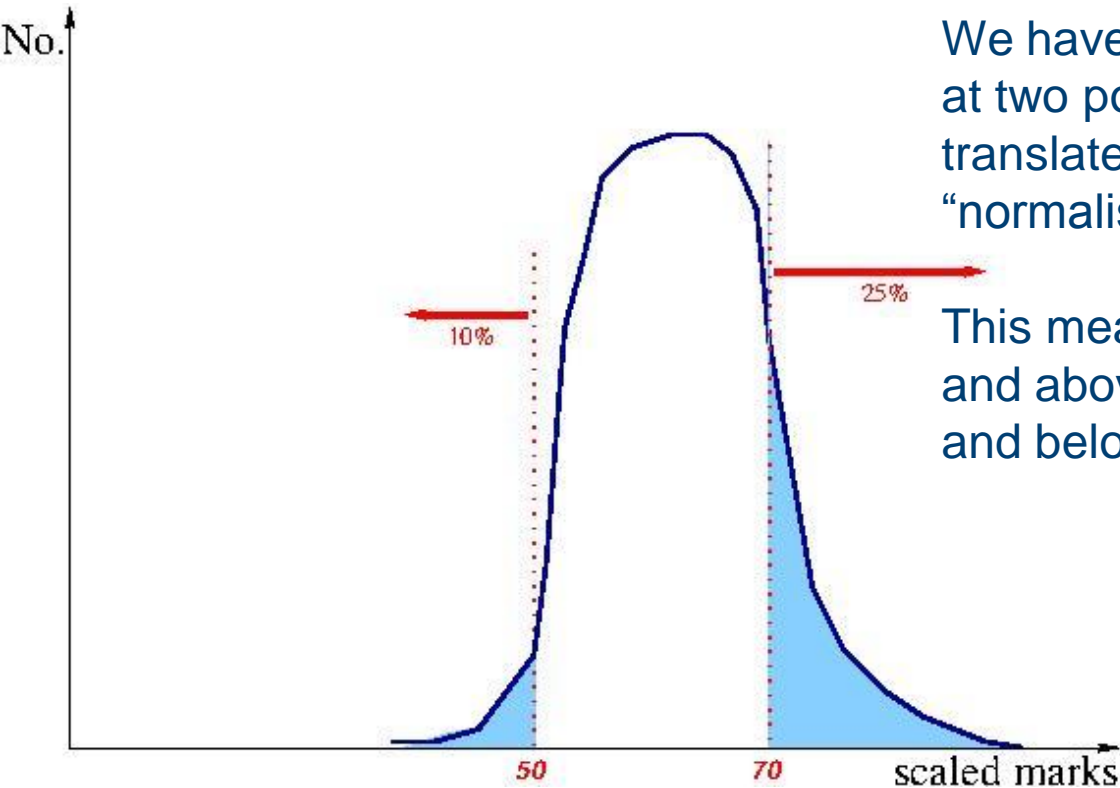
$$\text{If } x \geq A: \quad x := 70 + \frac{30(x - A)}{(100 - A)}$$

$$\text{If } A > x \geq B: \quad x := 50 + \frac{20(x - B)}{(A - B)}$$

$$\text{If } B > x \geq 0: \quad x := \frac{50x}{B}$$

e.g. if  $A = 75$ ,  $B = 37$ : a raw mark of 80 will become  $70 + 30(80 - 75)/(100 - 75) = 76.0$ ,  
a raw mark of 50 will become  $50 + 20(50 - 37)/(75 - 37) = 56.8$ ,  
a raw mark of 30 will become  $50.30/37 = 40.5$

# After the exam - Norm referencing

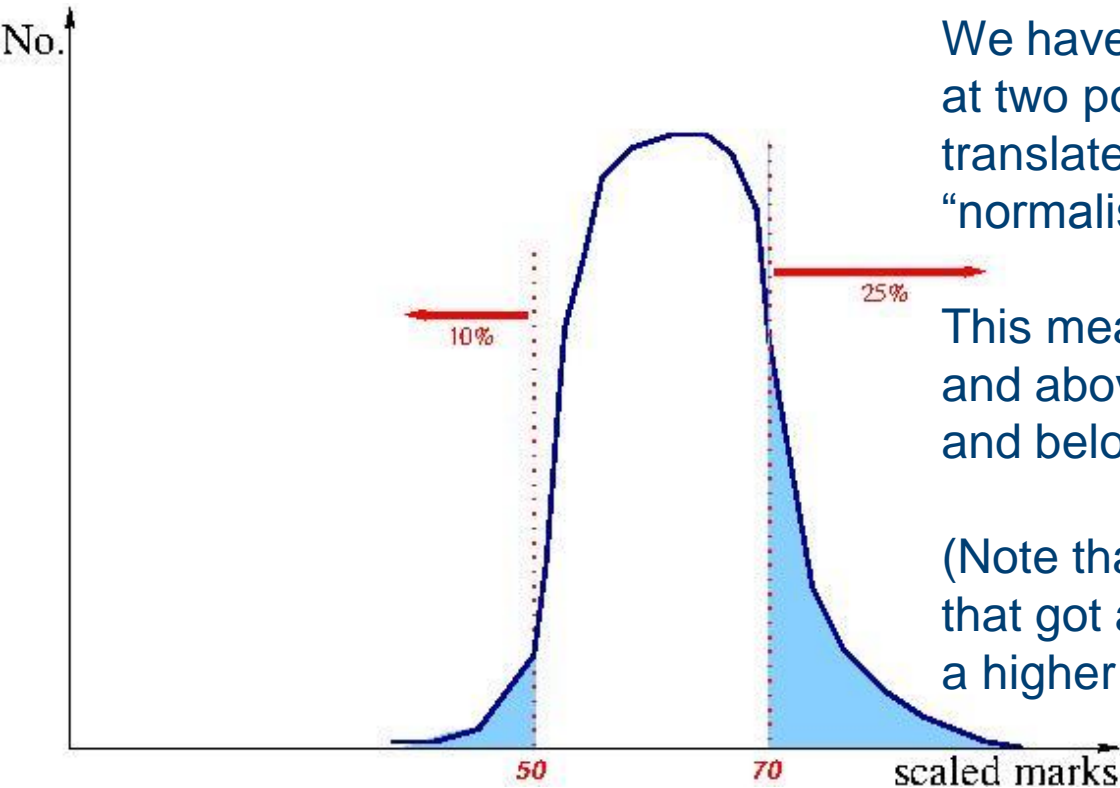


We have effectively taken hold of our curve at two points and *skewed* (and possibly translated) it to conform to some “normalised” shape.

This means that the top 25% get marks of 70 and above, the bottom 10% get marks of 50 and below.



# After the exam - Norm referencing



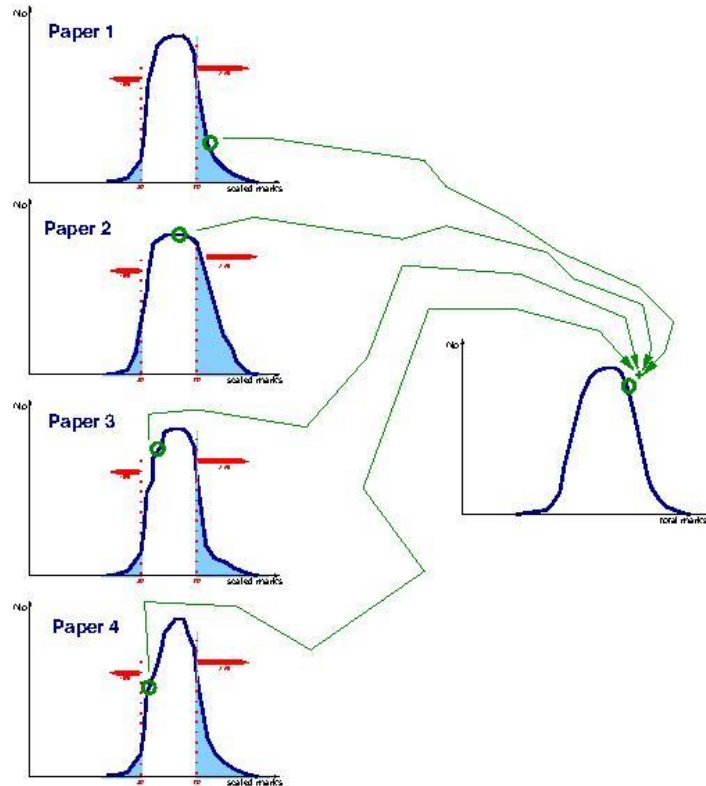
We have effectively taken hold of our curve at two points and *skewed* (and possibly translated) it to conform to some “normalised” shape.

This means that the top 25% get marks of 70 and above, the bottom 10% get marks of 50 and below.

(Note that ordering is preserved, anybody that got a higher raw mark than you still has a higher scaled mark, and likewise for lower)

If this is done on all of your papers **then** we can fairly add together the marks.

# After the exam – add up the marks



...like so.

(Note that there's a further complication for NatScis.)

# After the exam – Classing I

So we have all your marks, now we need to draw class boundaries

We (CST) follow the rules set out in the Marking and Classing document:

[www.cl.cam.ac.uk/teaching/exams/classing.pdf](http://www.cl.cam.ac.uk/teaching/exams/classing.pdf)

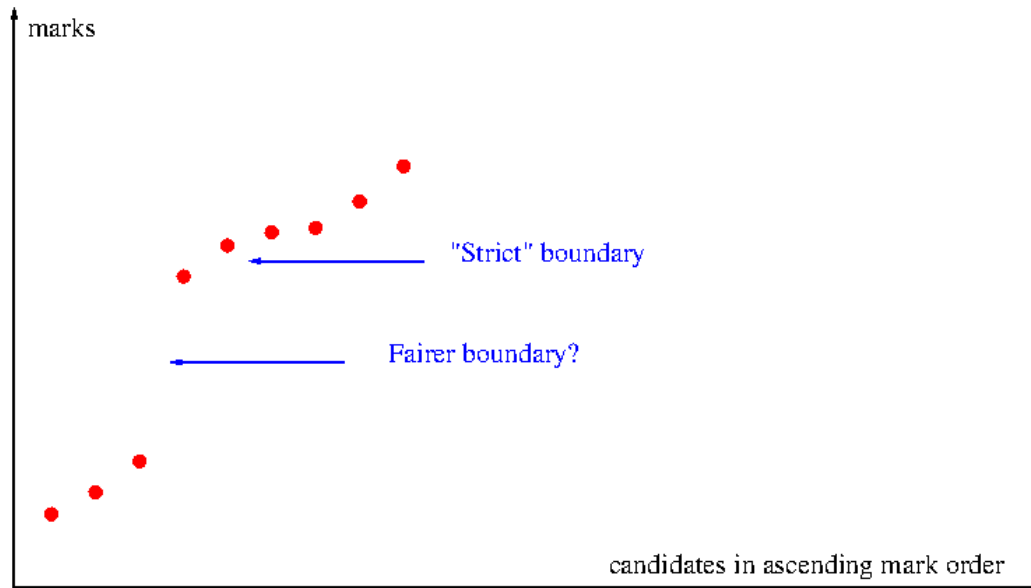
which states that examiners will partition the order-of-merit table thus:

- First 25%
- Upper Second 55%
- Lower Second 12.5%
- Third and Unclassed 7.5% (unclassified = mark below 40%)

Natscis – similar but different

# After the exam – Classing II

Examiners will actually use graphs like this, scatterplots, to determine the actual class boundaries



# After the exam - Results

Computer Science results will be published on Monday June 27th, in the afternoon.

They will be published on CamSIS.

Initial results will just be the class and paper marks, Directors of Studies will be given more information a day or two later.

(NatScis - different arrangements apply)

# The Examination Review Procedure, i.e. Appeals

There is a formal procedure for appeals:

- If you are unhappy about something concerning the conduct of the exam you must contact your Tutor within 3 days of your final paper. An appeal may be submitted which will be dealt with by the Examiners.
- After the classlist is published if you believe a mistake has been made you must contact your Tutor within 1 month of publication. An appeal may be submitted which will be dealt with by the Examiners.
- After either of the above if you are still dissatisfied you (or your Tutor) may appeal directly to the University Registry within 3 months of hearing from the Examiners.

# After the appeals – Uh oh!

It must be stressed that **very very** few people fail!

Fewer than 1% in Computer Science

The University will not say “You have failed” – it will simply not publish your name in the classlist. However, you may be granted an allowance to remain (see previous slide).

**What happens next is up to your college**

All will have some kind of internal appeals procedure but unless you are granted an allowance the rules are straightforward and as you would expect.

**The regulations do not allow re-sits**

# Computer Science with Mathematics **ONLY**

This slide is **ONLY** relevant to people reading Computer Science with Mathematics. If you are not such a person ignore it.

Alphas – we don't use them

You can safely ignore anything your Maths supervisors tell you about Alphas

| Paper x   | Paper y   |
|-----------|-----------|
| 15        | 10        |
| 5         | 10        |
| <b>20</b> | <b>20</b> |

For the Mathematicians Paper x is better than Paper y. For us they are exactly the same



# Computer Science Briefing Lecture

Copies of the slides are available as a PDF at my  
Computer Lab homepage:

**<http://www.cl.cam.ac.uk/users/ckh11>**