**IGCSE Statistics: CRICKET PLAYER SELECTION**

NAME: ......................................................................... DATE: ..............................

Use the batting statistics for the previous year (see **Table** **1**) to analyze the performance of RUFUS THWACK (player A) and IVOR NOTADUCK (player B). *Only one* should be selected to play for England, *you* must decide which one!

**Instructions**

1. Fill in **Table 1** and then use **Graphs 1 and 2** to **plot frequency density plots ('histograms')** for players A and B. Note the *axis scales are the same* to enable a *fair visual comparison.* Note the *modal* score, which is the *peak* of the histogram.

**REMEMBER:**

2. Fill in **Table 2** and then use **Graph 3** to plot a **cumulative frequency curve**. Use a *red* pen for player A and a *blue* pen for player B.

By finding where the 'S' shaped curves cut the 25%, 50% and 75% horizontal lines, estimate the **Lower Quartile (LQ), Median and Upper Quartile (UQ)** batting scores for each player.

3. Use the LQ, median and UQ results above to plot a **Box and Whisker diagram** for each player in **Graph 4** (which should be underneath the cumulative frequency diagram in **Graph 3**).

4. Using the information you have found out about each player, *justify which one should be selected.*

**Table 1: Batting statistics for players A and B.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **x= Runs scored per innings** | **Number of innings. Player A** | **Frequency density. Player A** | **Number of innings. Player B** | **Frequency density.**  **Player B** |
| 0 < x ≤ 10 | 10 | 10/10 = 1.00 | 2 |  |
| 10 < x ≤ 20 | 5 |  | 5 | 5/10 = 0.5 |
| 20 < x ≤ 30 | 12 |  | 15 |  |
| 30 < x ≤ 40 | 15 |  | 14 |  |
| 40 < x ≤ 60 | 4 |  | 8 |  |
| 60 < x ≤ 100 | 2 |  | 6 | 6/40 = 0.15 |
| 100 < x ≤ 150 | 2 | 2/50 = 0.04 | 10 |  |
| **TOTAL INNINGS** | **50** |  |  |  |

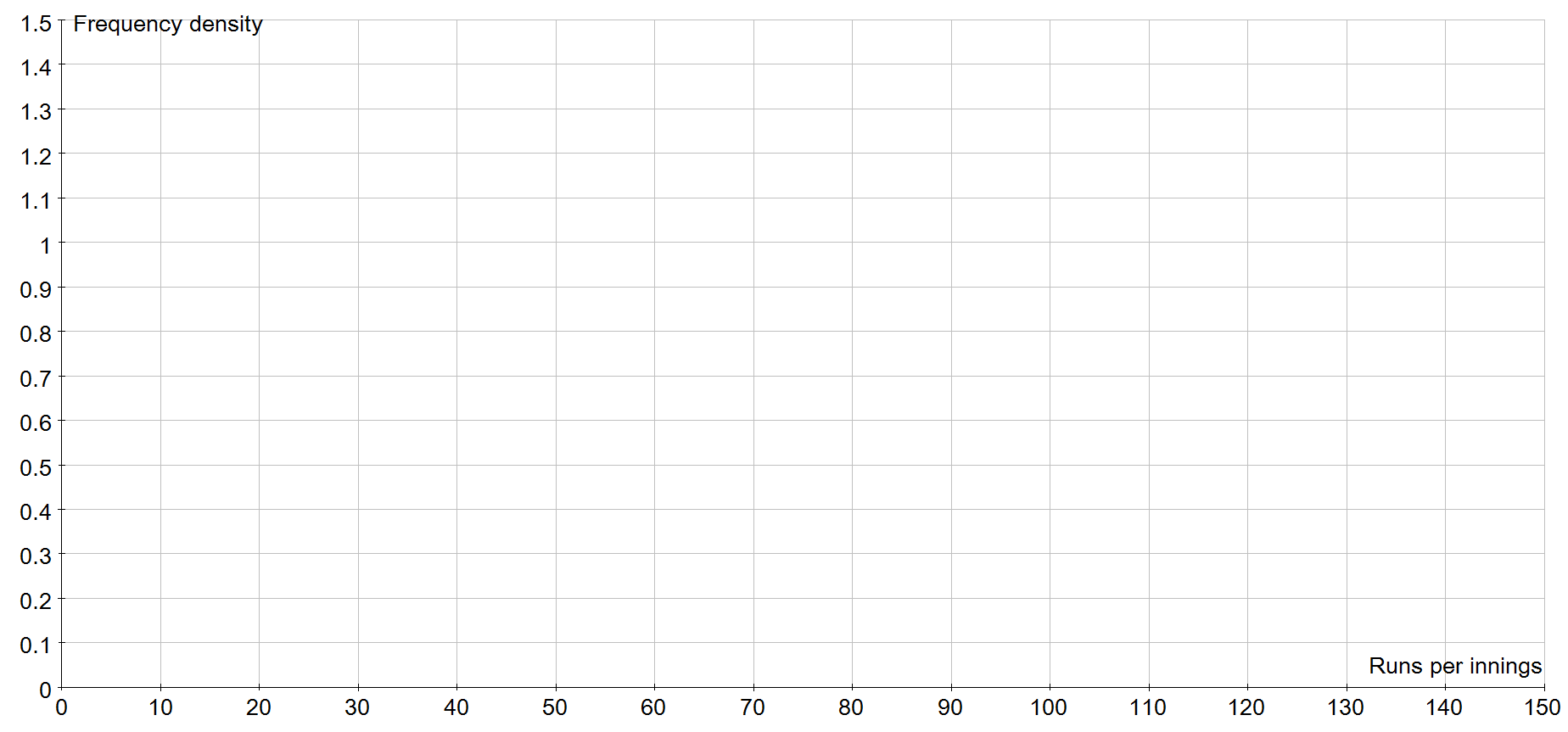
**Min x = 0** **Max x** = **150**  **Min Frequency density = 0** **Max frequency density = .......**

**Table 2: Cumulative frequency of innings vs runs scored.**

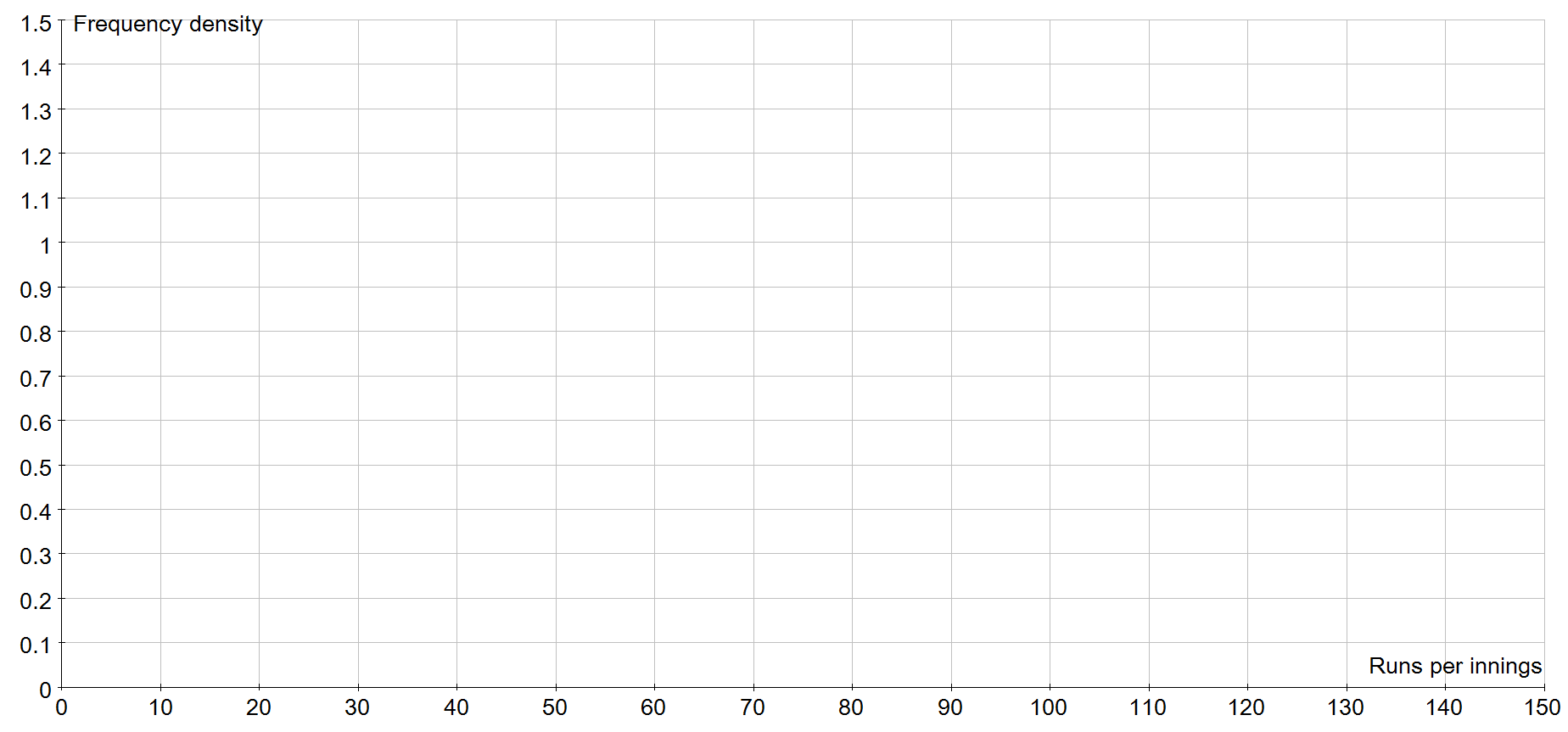
Since the total number of innings may be different for players A and B, divide the CUMULATIVE FREQUENCY NA (or indeed NB) by the total number of innings (see Table 1) and then multiply by 100 to get a percentage.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **M**  Maximum runs scored per innings | **NA**  Number of innings where score is ≤ maximum runs scored.  **PLAYER A** | **CA (%)**  Divide NA by  Total number of innings, then multiply by 100  **TOTAL INNINGS = 50** | **NB**  Number of innings where score is ≤ maximum runs scored.  **PLAYER B** | **CB (%)**  Divide NB by  Total number of innings, then multiply by 100  **TOTAL INNINGS = .....** |
| 10 | 10 | 100 x 10/50 = 20% |  |  |
| 20 |  |  | 7 |  |
| 30 | 27 | 100 x 27/50 = 54% |  |  |
| 40 |  |  |  |  |
| 60 |  |  | 44 | 100 x 44/60 = 73% |
| 100 |  |  |  |  |
| 150 | 50 | 100 x 50/50 = 100% |  | 100 x 60/60 = 100% |

**Graph 1. Frequency density plot for player A**



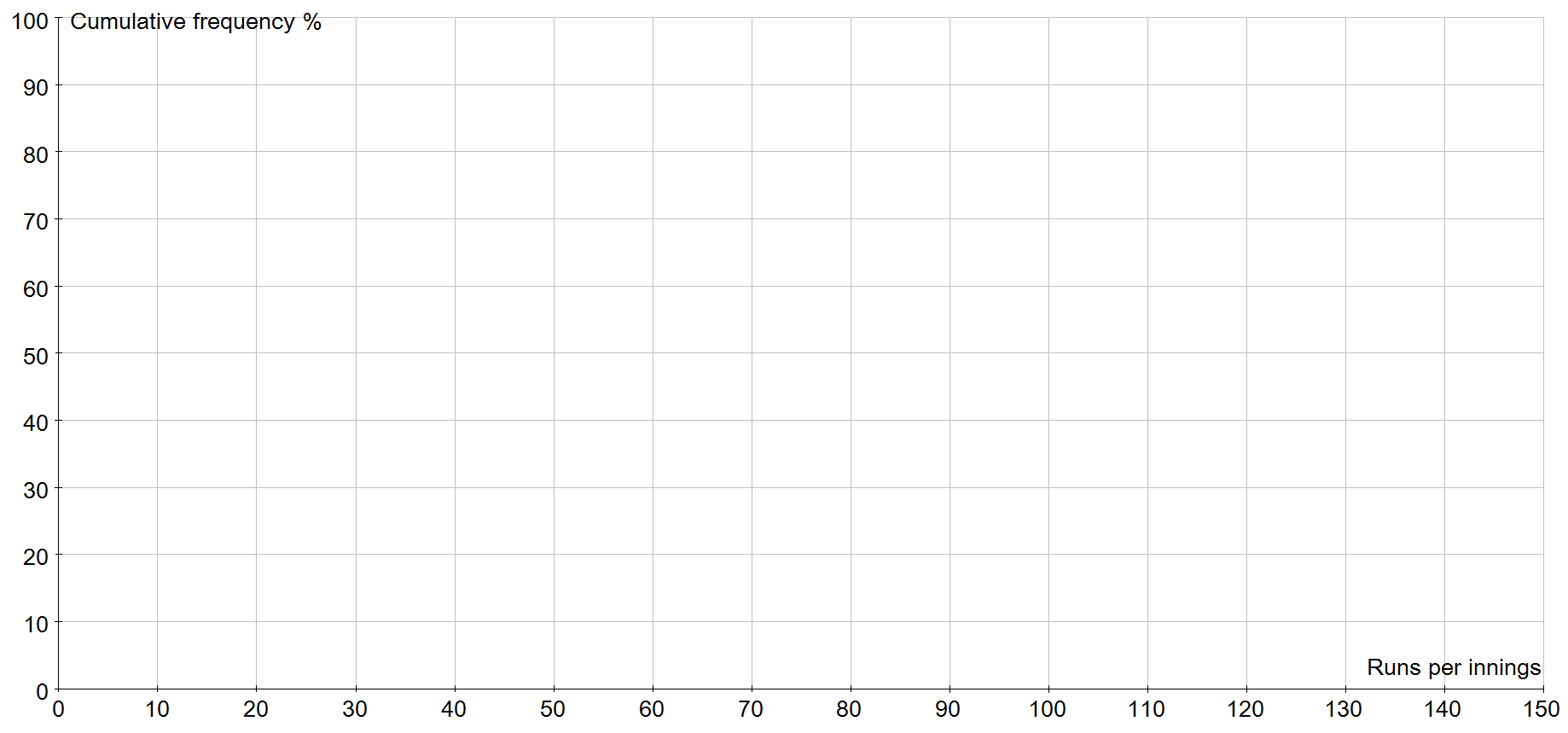
**Graph 2. Frequency density plot for player B**



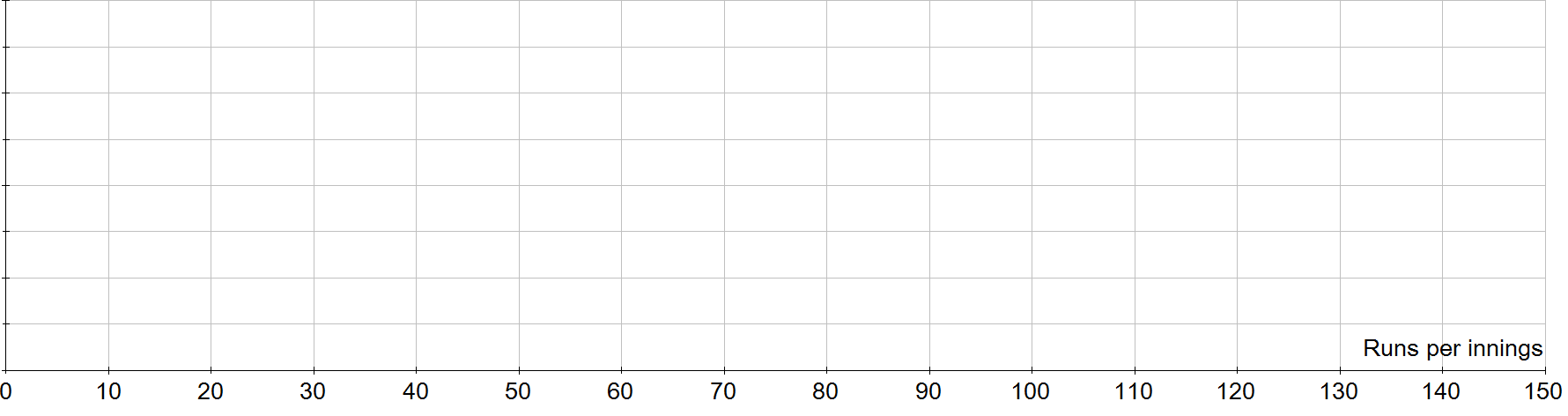
**MATHS HEALTH WARNING!** NOTE THESE TWO GRAPHS *USE THE SAME SCALE.* Graphs comparing two or more quantities (e.g. stock market price of a company vs time) can be *misleading* unless they both use the **same** **scales** in *both* horizontal and vertical axes.

**Did player B have a *different* total number of innings than player A? What does that tell you about the total *areas* of the above graphs? What could we do to make the comparison fairer? (HINT: Imagine player B's statistics were for *ten* years and player A just one. Assume they both play equally regularly!)**

**Graph 3:. Cumulative frequency plot for players A and B. (Use a red pen for A and a blue pen for B).**



**Graph 4: Box and whisker plot for players A and B.**



**PLAYER SELECTED:** ............................................................................

*Reason:* ......................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................... A. French 2012.