

Dear Prospective IB student,

Welcome to Mathematics HL! Attached is the summer work for your class. For the first part of the assignment, you must complete the Chapters in your book that deal with Probability and Statistics. A suggested schedule is given to you, if you would like feedback over the summer. However, you may turn in the entire assignment on the first day of class. The second part of the assignment is an example Internal Assessment task. You must write this up as a stand-alone technical paper, including all calculations and references. It is due the first day of class.

There will be a test on this entire assignment on the second day of class.

I will be available over the summer via email at amurray@rbrhs.org if you have any questions. I will also be holding help sessions August 24 and August 25 from 2-4 pm and August 29-31 1-3 pm, in Room 210.

Please note that it is recommended that you purchase a TI-84+ graphing calculator, since we will be using it in class during the year, you will need it to complete the summer assignment, and it is necessary for the IB exam. Please see Ms. S. Zielinski, Math Department Supervisor, if you need to borrow one from the school due to financial circumstances, or if you own a different model, such as the TI-89, that is not allowed on the IB External Assessment.

Please send me an email acknowledging your receipt of this packet as soon as possible so that I can easily construct an email list and keep you posted as to any changes in the summer help schedule.

Enjoy your summer and I look forward to having you in class next year!

Sincerely,

Ms. A. Murray
Teacher of Mathematics
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Little Silver, NJ 07739

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IB Mathematics HL 2 Summer Work 2011

The following table gives the assignments in your textbook. You must show work in order to receive credit, since the answers are in the back of the book. The dates in the last column are SUGGESTED. You should turn the work into the main office at RBR, and I will stop by over the summer to pick it up the day after it is due. If you are having trouble, I suggest you email me at amurray@rbrhs.org or use the website: <http://stattrek.com/>, which contains many useful tutorials. The entire assignment, your first grade of the marking period, will be collected and graded the first day of class. **DO NOT WAIT UNTIL THE LAST WEEK IN AUGUST TO DO THIS ASSIGNMENT!!** You will need to have completed all of the textbook work before you do the Internal Assessment.

Chapter	Assignment	Page Numbers	Suggested due date
Part 1:			
17	Review Set 17A	pp. 520-522	7/15/11
18	Review Set 18B	pp. 565-566	7/30/11
28	Review Set 28A	pp. 810-811	8/15/11
29	Review Set 29A	pp. 830-831	8/25/11
Part 2:			
Internal Assessment Practice	See Attached	N/A	First Day of School

Write up the following as a stand-alone technical paper, using your knowledge of statistics. It is an example of an Internal Assessment Task.

MODELLING THE HEIGHTS OF SAPLINGS

HL TYPE II

Description

The following data come from a random sample of 1000 saplings collected from a representative 0.25 km^2 area in a forest. Your job is to find a way to use this random sample to develop a *probability density function (pdf)* to model the population of all such saplings in the area in which the sample was taken.

Heights (m)	Frequency
0.00–0.25	61
0.25–0.50	160
0.50–0.75	209
0.75–1.00	202
1.00–1.25	158
1.25–1.50	105
1.50–1.75	58
1.75–2.00	29
2.00–2.25	12
2.25–2.50	4
2.50–2.75	1
2.75–3.00	1

Checking available models

1. Find a graphical way to show the data.
2. Add two other columns to the chart, entering the expected frequencies for the 1000 saplings for both a normal and Poisson distribution. Test each as a possible model for the data.
3. Could either of these be developed as a probability density function for the data? Explain.

Creating your own model

4. List the requirements for a probability density function.
5. A useful method for finding a *pdf* for a given data set is to begin with a function that best describes the data's associated *cumulative relative frequency curve*. What traits must this function possess in order to be defined as a *cumulative density function (cdf)* for the *pdf* you are creating?
6. Find a suitable function for this *cdf*, check it to see if it has the necessary traits, and refine it if necessary.
7. What is the relationship between your *cdf* and the required *pdf*? Explain. Find the *pdf* for this *cdf* and evaluate it. If it does not satisfy all conditions, might it still be acceptable?
8. Continue the search for a good *cdf* and *pdf*. Explain why your final result is the best and indicate its limitations.

Applying your model

9. If you were asked to develop a *pdf* for a different forest region, comment on the applicability of the current model.