

QUANTITATIVE METHODS

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LAB 2

Math with Excel and Random Samples

Doing Mathematics with Excel

Go to Excel.

In cell A1 write in Bold 20 "Mathematics with Excel". In cell A2 write "Lab 3" in size 12 and in cell A3 write "By: your name" in size 12. Label Sheet 1 "Excel as a Calculator". Save your work under LAB 3. Don't forget to periodically save your work!

In cell A5 write "Question" in bold and in cell B5 write "Answer" in bold. Do the same thing with cells D5 and E5.

Write 1 in cell A6 and 3 in cell A7. Use your mouse to have the odd numbers up to 15 appear in the cells A6 to A13. Write 2 in cell D6 and 4 in cell D7. Use your mouse to have the even numbers up to 15 appear in the cells D6 to D13. The columns A and D should have a center alignment.

Perform the following arithmetic operations in the cells to the right of the question number. **Do not simply write the answer.** Instead, write a formula so that Excel will calculate the answer. You may check your work with a calculator, or the solutions at the back. Take note that you will sometimes have to add brackets to evaluate correctly. Also, for every decimal answer that you obtain, only show two decimal places.

1. $5 + 3 \times 2$

2. $\frac{4 + 5}{2}$

3. $\frac{2 + 36}{8 - 2}$

4. $\frac{1 + 4^3}{4^2 - 1}$

5. $\frac{2 - \frac{1}{4}}{3 + \frac{1}{3}}$

6. $\frac{2 + 5 + 7 + 10 + 12}{5}$

7. 2^{3+1}

8. $2 \times 4 + 9 \div 5$

9. $3.17 + 2.1 \times 8.7$

10. $2\sqrt{5} + 1$

11. $\frac{2 - \sqrt{2}}{2 + \sqrt{2}}$

12. $\sqrt{2 + \sqrt{3}}$

13. $\sqrt{\frac{3+5}{2}}$

14. $\sqrt{\frac{(1-3)^2 + (2-3)^2 + (6-3)^2}{2}}$

15. $115 + 1.96 \frac{20}{\sqrt{6}}$

16. $12 - 2.33 \frac{2}{\sqrt{115}}$

Note that in Excel,

* is used for multiplication

/ is used for division

^ is used for exponents. For example, 5^2 is written as 5^2 .

Functions such as $\sqrt{\quad}$ can be found by clicking on f_x and in “Select a Category” choose MATH & TRIG and in “Select a function” choose SQRT. A dialogue box then appears where you can enter the number for which you want to find the square root.

Here are the answers.

Question	Answer	Question	Answer
1	11	2	4.50
3	6.33	4	4.33
5	0.53	6	7.20
7	16	8	9.80
9	21.44	10	5.47
11	0.17	12	1.93
13	2	14	2.65
15	131.00	16	11.57

Random Samples

Example 1

Suppose there are 800 students at SLC, each numbered from 1 to 800. Let us draw a random sample of 15 students.

Go to cell A5 and write “Sample”.

Go to TOOLS – DATA ANALYSIS – RANDOM NUMBER GENERATOR. If the Data Analysis is not present in tools, then go to TOOLS – ADD-INS and click on ANALYSIS TOOLPAK. The option DATA ANALYSIS should now appear in the TOOLS menu.

Fill in the dialogue box as shown on the right.

Note that in the parameters, we add 0.5 to both sides of the interval since we want numbers between 1 and 800 inclusively.

When you are done, click OK. You should see 15 numbers appearing in column A. Round off the numbers so that there are no decimals, and order your sample using the



button. This is done mainly to verify for repetitions. If there are any repetitions, you can repeat the above procedure for either all the 15 numbers, or just for the repetitions.

Example 2

There are 100 students enrolled in QM this fall. Let us draw a random sample of 5 students by taking 5 student numbers out of the list of all student numbers for students enrolled in QM.

Go to cell A5 and write “Student Number” in bold.

Open the worksheet “Data – Student Number” from my web site (www.slc.qc.ca/mh) and copy the sample results in cells A6:A105.

In cell B5 write “Sample” in bold.

Go to TOOLS – DATA ANALYSIS – SAMPLING. The INPUT – RANGE is the data you imported, that is cells A6:A105. The NUMBER OF SAMPLES is 5, and lastly the OUTPUT RANGE is cell B6.

Once you have your sample, you must order it and make sure there are no repetitions. If there are some, you can draw another sample, either of the same size or of size 1 just to replace a particular repetition.