

TI-84+ Lab 5 for Statistics 301

Topics: factorials, permutation, combinations

Dataset(s): none

Factorials, Permutations and Combinations.

- A friend of mine went to a wine tasting event featuring Chardonnay wine. There were 20 wines available for tasting and she decided to try 8. Assuming the order of tasting is relevant, determine all the possible ways she can taste the 8 types of wine.

The answer to this question (assuming sampling without replacement where order matters) is: $(20)(19) \cdots (13) = \frac{20!}{12!}$.

There are (at least) two possible ways to use the TI-84+ to perform this calculation. One involves the factorial key and the other involves the permutation key.

Following the factorial approach, enter:

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- 20 MATH < ▽ ▽ ▽ ENTER ÷
- 12 MATH < ▽ ▽ ▽ ENTER

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to arrive at 5,079,110,400.

Following the permutation approach, enter:

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- 20 MATH < ▽ ENTER 8 ENTER

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to, once again, arrive at 5,079,110,400.

- Shortly after being put into service, some buses manufactured by a certain company have developed cracks on the underside of the main frame. Suppose a particular city has 20 of these buses and cracks have actually appeared in 8 of them. How many different ways are there to select a sample of 5 buses from the 20 for a thorough inspection?

The answer, here, is: $\frac{20!}{5!15!}$. Using the calculator, the number is found by entering

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20 MATH < ▽ ▽ 5 ENTER

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which gives 15,504.