How can I use the geometpdf() and geometcdf() functions on my TI-84 calculator?

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The geometpdf() and geometcdf() functions are two useful tools on the TI-84 calculator that can be used to calculate probabilities in geometric distributions. These functions allow users to easily find the probability of a specific number of trials needed to achieve a certain event, as well as the cumulative probability up to a given number of trials. By inputting the appropriate values, such as the success rate and number of trials, users can quickly and accurately determine the probability of a specific outcome. This can be particularly helpful for solving problems involving geometric distributions, such as the number of attempts needed to win a game or the likelihood of a certain number of successes in a given number of trials. Overall, the geometpdf() and geometcdf() functions provide a convenient and efficient way to calculate probabilities in geometric distributions on the TI-84 calculator.

Use geometpdf() and geometcdf() on a TI-84 Calculator

The describes the probability of experiencing a certain number of failures before experiencing the first success in a series of trials that have the following characteristics:

There are only two possible outcomes - success or failure.
The probability of success is the same in each trial.

If a *X* follows a geometric distribution, then the probability of experiencing *k* failures before experiencing the first success can be found by the following formula:

P(X=k) = (1-p)kp

where:

k: number of failures before first success
p: probability of success on each trial

The cumulative probability that we experience *k* or less failures until the first success can be found by using the following formula:

$$P(X \leq k) = 1 - (1-p)^{k+1}$$

To calculate probabilities related to the geometric distribution on a TI-84 calculator, we can use the following functions:

geometpdf(probability, trials)
geometcdf(probability, trials)

The following examples show how to use each of these functions in practice.

Example 1: How to Use geometpdf()

Suppose a researcher is waiting outside of a library to ask people if they support a certain law. The probability that a given person supports the law is p = 0.2. What is the probability that the fourth person the researcher talks to is the first person to support the law?

To answer this, we can use the geometpdf() function.

Press 2nd and then press VARS. Scroll down to geometpdf() and press ENTER.

Then type in the following values and press ENTER.

The probability that the fourth person the researcher

talks to is the first person to support the law is 0.1024.

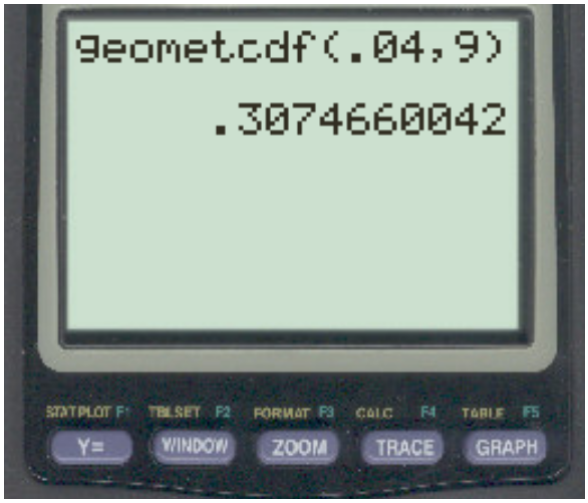
Example 2: How to Use geometcdf()

Suppose it's known that 4% of individuals who visit a certain banker are visiting to file bankruptcy. What is the probability that the banker will meet with less than 9 people before encountering someone who is filing for bankruptcy?

To answer this, we can use the geometcdf() function.

Press 2nd and then press VARS. Scroll down to geometcdf() and press ENTER.

Then type in the following values and press ENTER.



The probability that the banker will meet with less than 9 people before encountering someone who is filing for bankruptcy is 0.307466.

Bonus: Feel free to use this to confirm your results.