Geometric Mean

What is the 'Geometric Mean'

The geometric mean is the average of a set of products, the calculation of which is commonly used to determine the performance results of an investment or portfolio. It is technically defined as "the 'n'th root product of 'n' numbers." The geometric mean must be used when working with percentages, which are derived from values, while the standard arithmetic mean works with the values themselves.

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If you have $10,000 and get paid 10% interest on that $10,000 every year for 25 years, the amount of interest is $1,000 every year for 25 years, or $25,000. However, this does not take the interest into consideration. That is, the calculation assumes you only get paid interest on the original $10,000, not the $1,000 added to it every year. If the investor gets paid interest on the interest, it is referred to as compounding interest, which is calculated using the geometric mean. Using the geometric mean allows analysts to calculate the return on an investment that gets paid interest on interest. This is one reason portfolio managers advise clients to reinvest dividends and earnings.

The geometric mean is also used for present value and future value cash flow formulas. The geometric mean return is specifically used for investments that offer a compounding return. Going back to the example above, instead of only making $25,000 on a simple interest investment, the investor makes $108,347.06 on a compounding interest investment. Simple interest or return is represented by the arithmetic mean, while compounding interest or return is represented by the geometric mean.

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Now Geometric mean in your geometry class

Geometric mean (GM) Connects with similar figures.

Constructing the altitude of hypotenuse of a right triangle creates three triangles which are similar. By setting the proportions for the similar triangles you create three geometric means.

Basic Video 1(4 min): https://www.youtube.com/watch?v=Kvu_RVp0ZJY

More details 2 (15 min): https://www.youtube.com/watch?v=PXBFDBmBP0I