

Rewriting Exponential Functions For Equivalent Rates

Class Notes

At times, it is appropriate to rewrite an exponential function in a different form to highlight or find a different value. Today, we will be rewriting to identify an equivalent interest rate.

In order to rewrite an exponential function to find an equivalent rate you will

1. Write the function out using the given information
2. Determine which variable will be changing (the exponent)
3. Use properties of rational exponents to rewrite as necessary $(b^x)^y = b^{x \cdot y}$
4. Simplify your new function
5. Use the values in your new function to determine equivalent rates

Equivalent Interest Rates NOTES.notebook

Example:

The value of a brand new car is \$32,000 and the value depreciates 25% every year. Write a function to represent the value of the car after t years, where the *quarterly* rate of change can be found from a constant in the function. Round all coefficients in the function to four decimal places. Also, determine the percentage rate of change per quarter, *to the nearest hundredth of a percent*.

Example:

The number of users on a website is 6700 and is growing exponentially at a rate of 79% per year. Write a function to represent the number of users on the website after t years, where the *daily* rate of change can be found from a constant in the function. Round all coefficients in the function to four decimal places. Also, determine the percentage rate of change per day, *to the nearest hundredth of a percent*.

Annual Equivalent Rates (AER)

Annual equivalent rates can be used to compare two accounts with different compounding periods.

Annual equivalent rates give us a "level playing field" to compare.

$$AER = \left(1 + \frac{r}{n}\right)^n - 1$$

If this looks familiar, it should! AER just calculates the interest earned in one year!

Example

Find the annual equivalent rate for an account that accrues 4.9% interest compounded weekly.

How does that compare to an account that earns 4.75% compounded daily?