Continuously Compounded Interest

Continuously Compounded Interest is one of three types of interest you will learn in Algebra 1, the other two being compound interest and simple interest. Each type has a formula that you use for all types of these problems.

The formula for continuously compounded interest is:

$$A = Pe^{rt}$$

A = The balance (FINAL amount)

P = The principal (STARTING amount)

e = The base of natural logarithms

r = The interest rate (as a DECIMAL)

t = Time in YEARS

The key to solving continuously compounded interest problems is to get the values of P, r, and t (e is on your calculator) from the question to solve for a.

Let's practice with a couple of examples!

Lexi puts $300 into an account that earns 20% interest, compounded continuously. How much will be in the account in 5 years?

We know what p, r, and t are from the question, so we need to use the formula $A = Pe^{rt}$ to solve for A.

$P = \$300$ $r = 0.20$ $t = 5$

$$rt = 0.2 * 5 = 1$$

$$A = Pe^{rt}$$

$$A = \$300e^{1}$$

$$A = \$300(2.718)$$

$$A = \$815.48$$

James puts $200 into an account that is earning 40% interest, compounded continuously. How much will be in the account in 5 years?

$P = \$200$ $r = 0.40$ $t = 5$

$$rt = 0.4 * 5 = 2$$

$$A = Pe^{rt}$$

$$A = \$200e^{2}$$

$$A = \$1,477.81$$

Tips for Solving Problems:

1. Remember the formula for continuously compounded interest, $A = Pe^{rt}$! Use this formula, when given P, r, and t, to find A or the total value of an account that is continuously compounded.

2. Remember that e is BEING RAISED to the power of rt and that e and rt are not being multiplied together.

3. The interest rate has to be changed from a percentage to a decimal (divide the percentage by 100) and t needs to be in YEARS, so change it if you are given t in months.