Compound Interest

Finite Math

17 February 2017

Review

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$$A = Pe^{rt}$$

A, P, and r are the same as above and t is time measured in years.

Continuous Compound Interest

Example

If $\$1,000$ *is invested at* 6% *interest compounded continuously, what is the value of the investment after* 8 *years? Round answers to the nearest cent.*

Now You Try It!

Example

If $\$2,000$ *is invested at* 7% *compounded (a) daily, (b) continuously, what is the amount after* 5 *years? How much interest is accrued in each case? Round answers to the nearest cent. (Assume* 365 *days in a year.)*

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If $\$2,000$ *is invested at* 7% *compounded (a) daily, (b) continuously, what is the amount after* 5 *years? How much interest is accrued in each case? Round answers to the nearest cent. (Assume* 365 *days in a year.)*

Solution

(a) $\$2838.04$ *with* $\$838.04$ *in interest.*

(b) $\$2838.14$ *with* $\$838.14$ *in interest.*

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Example

New parents are looking at a college savings account which gives 8% *interest. If they are looking to have* $\$80,000$ *when their child is ready to go to college in* 17 *years, how much should they invest now if interest is compounded (a) semiannually, (b) continuously? Round answers to the nearest cent.*

Now You Try It!

Example

You are looking at a retirement account which pays 2% interest. If you are looking to have $\$1,000,000$ *in the account by the time you retire in* 50 *years how much should you invest now if interest is compounded (a) quarterly, (b) continuously? Round answers to the nearest cent.*

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You are looking at a retirement account which pays 2% interest. If you are looking to have $\$1,000,000$ *in the account by the time you retire in* 50 *years how much should you invest now if interest is compounded (a) quarterly, (b) continuously? Round answers to the nearest cent.*

Solution

(a) $\$368,797.23$

(b) $\$367,879.44$

Compound Interest

Example

How long will it take $\$10,000$ *to grow to* $\$25,000$ *if it is invested at* 8% *compounded quarterly?*

Now You Try It!

Example

How long will it take money to triple if it is invested at (a) 5% compounded daily? (b) 6% compounded continuously?

Now You Try It!

Example

How long will it take money to triple if it is invested at (a) 5% *compounded daily? (b)* 6% *compounded continuously?*

Solution

(a) $8,021$ *days (about* 21.975 *years)*

(b) 18.310 *years*