

Friday, February 28, 2014

A savings account has annualized interest rate of 5%. The balance of a deposit \$100 after one year would be $100(1 + 0.05/4)^4$ if a bank compound the interest quarterly. What would be the balance after one year if a bank compound the interest every moment for a deposit of \$100?

Solution.

Balance = $\lim_{n \rightarrow \infty} 100(1 + 0.05/n)^n = 100 \left[\lim_{n \rightarrow \infty} (1 + 1/(n/0.05))^{n/0.05} \right]^{0.05} = 100e^{0.05}$, which is approximately \$105.13.

Good Luck! Have fun and enjoy Mathematics!