# Chapter 11 – 1 Continuous Compound Interest

**Example 1.** Find



**Example 2.** Find the future value of $1,000 invested for 10 years at 5%

A) compounded annually.

B) compounded semiannually.

C) compounded quarterly.

D) compounded monthly.

E) compounded weekly.

F) compounded daily.

G) compounded hourly.

H) compounded continuously.

**Example 3.** How long will it take for an investment of $2,000 to grow to $3,000 at 4% compounded continuously? What is the APY of this investment?

APY is the interest on $1 for 1 year expressed as a percent:

**Example 4.** What nominal interest rate (compounded continuously) is needed for an investment of $2,000 to grow to $3,000 in 7 years? What is the corresponding APY?

**Example 5.** How much would I need to invest at 1.5% compounded continuously in order to have $10,000 at the end of 4 years? What is the APY of this investment?

**Example 6.** A mathematical model for the decay of radioactive substances is given by

where Q0 is the amount of the substance at time t = 0, r is the continuous compound rate of decay per year, t is the time in years, and Q is the amount of the substance at time t.

If the continuous compound rate of decay per year is -0.0004332, how long will it take a given amount of radium to decay to half that amount? (This time period is called the half-life of the substance).