Exponential Decay: $y = a(1-r)^t$

y = final amount
a = initial amount
r = rate (change from a percent to decimal)
t= time

Example 8: A cup of coffee contains 130 milligrams of caffeine. If caffeine is eliminated from the body at a rate of 11% per hour, how long will it take for half of this caffeine to be eliminated from a person's body?

Example 9: A computer system depreciates at an average rate of 4% per month. If the value of the computer system was originally $12,000, in how many months is it worth $7,350?

Exponential Growth: $y = a(1+r)^t$

y = final amount
a = initial amount
r = rate (change from a percent to decimal)
t= time

Example 10: The population of a city of one million is increasing at a rate of 3% per year. If the population continues to grow at this rate, in how many years will the population have doubled?

Example 11: In 1910, the population of a city was 120,000. Since then, the population has increased by exactly 1.5% per year. If the population continues to grow at this rate, what will the population be in 2010?

$2,000 is deposited into your account at 12% per year, compounded continuously. How much will you have after 2 years?

You deposit $7550 into an account that pays 7.25% interest, compounded continuously. How long will it take the money to triple?

Determine the principal that will yield $200,000 when invested at 8% compounded daily for 20 years.

A total of $12,000 is invested at an annual interest rate of 9%. Find the balance after 5 years if it is compounded

a. Quarterly:

b. Monthly:

c. Continuously: