Compound interest:

rate, $A = P(1+\frac{r}{n})^{nt}$ where A is the final amount, P is the initial investment, r is the interest t is time, n compounding's per year

Continuous compounding:

$$A = Pe^{rt}$$

Where A is the final amount, P is the initial investment, r is the interest rate, and t is time

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

$A = ?$ $t = 5$
$P = 12{,}000$
$r = .09$
$n = 12$

$A = P(1+\frac{r}{n})^{nt}$
$A = 12{,}000(1+\frac{.09}{12})^{5(12)}$
$A = 12{,}000(1.0075)^{60}$
$A = 12{,}000(1.565)$

$A = \$18{,}788.17$

26. A total of $1000 is invested at an annual interest rate of 6.5%. How many years will it take for your money to double if it is compounded continuously?

$P = 1000$
$r = .065$
$t = ?$
$A = 2000$

$A = Pe^{rt}$
$2000 = 1000e^{(.065)t}$
$2 = e^{.065t}$
$\ln 2 = \ln e^{.065t}$
$\ln 2 = .065t$
$t = \frac{\ln 2}{.065} \approx 10.664$