Section 12.1 Continued

Leonhard Euler

$$e = \lim_{n\to\infty} \left(1+\frac{1}{n}\right)^n \approx 2.71828\ldots\ldots$$

$$e \approx 2.72$$

$$e^{3.7} = e\,\hat{}\,(3.7) \approx 40.45$$

e^x button

$$20e^{4.3} \approx 1473.996 \approx 1474$$

$$13e^{-.05\cdot 13} \approx 6.8 \approx 6.79$$

$$13 * e\,\hat{}\,(-.05 * 13)$$

Compound Interest

n compoundings per year

$$A = P\left(1+\frac{r}{n}\right)^{nt}$$

Continuous compounding

$$A = Pe^{rt}$$

A = amt after t years

P = principal (amt. you invest)

r = interest rate

n = # of compoundings per year

t = time in years

annually	$n = 1$
semiannually	$n = 2$
quarterly	$n = 4$
monthly	$n = 12$
bimonthly	$n = 24$

How much will you have if you invest $5000 in an account that earns 6% interest compounded quarterly for 26 years?

$P = 5000$

$r = .06$

$t = 26$

$n = 4$

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 5000\left(1 + \frac{.06}{4}\right)^{(4 \cdot 26)}$$

$5000(1+.06/4)\text{^}(4*26) = 23,520.06$

What if interest is compounded continuously?

$$A = Pe^{rt}$$

$$A = 5000e^{(.06*26)} = 23,794.11$$

$5000e\text{^}(.06*26)$