Closing Tues: 6.3, 6.4
Closing Thur: 6.5

	Ordinary (Payments at END of each period)	**Due** (Payments at BEGINNING of each period)
FV (Balance Growing)	$F = R\dfrac{(1+i)^n - 1}{i}$	$F = R\dfrac{(1+i)^n - 1}{i}(1+i)$
PV (Balance Shrinking)	$P = R\dfrac{1-(1+i)^{-n}}{i}$	$P = R\dfrac{1-(1+i)^{-n}}{i}(1+i)$

R = amount of each regular payment

r = decimal interest rate

m = num. of compoundings in a year

Compute:

$i = \frac{r}{m}$ = rate at each compounding

$n = mt$ = total payments

Interest and Annuities: Since
R = payment amount, and
n = total number of payments
we have $R \cdot n$ = total amount paid.

Thus, for FV questions

$$\textit{Total interest earned} = F - R \cdot n$$

and for PV questions

$$\textit{Total interest paid} = R \cdot n - P$$

HW 6.3 / 6: Grandparents plan to open an account on their grandchild's birthday and contribute each month until she goes to college. How much must they contribute at the beginning of each month in an investment that pays 6%, compounded monthly, if they want the balance to be $200,000 at the end of 18 years? And how much total interest do they earn?

Chapter 6 Summary

1. Are there regular payments?
   (a) NO: it's a LUMP SUM problem.
   (b) YES: it's an ANNUITY problem.

2(a) For LUMP SUM, does it say:
   (i) ``simple interest"?
   (ii) ``compound continuously"?
   (iii) ``compounded m times a year"

2(b) For ANNUITIES,
   (i) payments at BEGINNING or END?
   (ii) balance GROWING or SHRINKING?

HW Question 6.3 Problem 7(a)(b):

A small business owner contributes $2000 at the end of each quarter to a retirement account that earns 10% compounded quarterly.

(a) How long will it be until the account is worth $150,000? (Round your answer to the nearest *quarter*.)

(b) Suppose when the account reaches $150,000, the business owner increases the contributions to $4000 at the end of each quarter. What will the total value of the account be after 15 more years?

(Old Final Question)

Immediately after graduating from college, Julian started a savings plan, depositing $200 at the end of each month in an account paying 3% interest, compounded monthly. After 6 years, Julian stopped making payments but left the money in the account, gaining interest at the same rate, for an additional 4 years.

(a) How much money is in the account in 6 years?

(b) How much money is in the account in 10 years?