Assignment 1

Due Date: Sep. 18 (Wednesday) 23:59

1.

At an annual effective interest rate of i, $i > 0$, the following are all equal:

(i) the present value of 10000 at the end of 6 years;
(ii) the sum of the present values of 6000 at the end of year t and 56000 at the end of year $2t$; and
(iii) 5000 immediately.

Calculate the present value of a payment of 8000 at the end of year $t + 3$ using the same annual effective interest rate.

2.

You are given:

(i) Fund X accumulates at an interest rate of 8% compounded quarterly;
(ii) Fund Y accumulates at an interest rate of 6% compounded semiannually;
(iii) at the end of 10 years, the total amount in the two funds combined is 1000; and
(iv) at the end of 5 years, the amount in Fund X is twice that in Fund Y.

The Measurement of Interest

Calculate the total amount in the two funds at the end of 2 years.

3.

Brian and Jennifer each take out a loan of X.

Jennifer will repay her loan by making one payment of 800 at the end of year 10. Brian will repay his loan by making one payment of 1120 at the end of year 10.

The nominal semiannual rate being charged to Jennifer is exactly one-half the nominal semiannual rate being charged to Brian.

Calculate X.

4.

On January 1, 1980, Jack deposited 1,000 in Bank X to earn interest at the rate of j per annum compounded semiannually. On January 1, 1985, he transferred his account to Bank Y to earn interest at the rate of k per annum compounded quarterly. On January 1, 1988, the balance at Bank Y is 1,990.76.

If Jack could have earned interest at the rate of k per annum compounded quarterly from January 1, 1980 through January 1, 1988, his balance would have been 2,203.76.

Calculate the ratio k/j.

5.

Joe deposits 10 today and another 30 in five years into a fund paying simple interest of 11% per year.

Tina will make the same two deposits, but the 10 will be deposited n years from today and the 30 will be deposited $2n$ years from today. Tina's deposits earn an annual effective rate of 9.15%.

At the end of 10 years, the accumulated amount of Tina's deposits equals the accumulated amount of Joe's deposits.

Calculate n.

6.

You are given the following data on three series of payments:

	Payment at end of year			Accumulated value at end of year 18
	6	12	18	
Series A	240	200	300	X
Series B	0	360	700	$X + 100$
Series C	Y	600	0	X

Assume interest is compounded annually.

Calculate Y.