7-6 RENTALS, CONDOMINIUMS, AND COOPERATIVES

ADVANCED FINANCIAL ALGEBRA

WHAT ALTERNATIVES ARE THERE TO PURCHASING A SINGLE-FAMILY HOME?

- Maintaining your own house and land requires time as well as money: mowing lawns, shoveling snow, painting, repairs, etc.

- You could rent an apartment which does not require a large down payment, but at the end of the lease, you do not own anything.

- Another possibility is a condominium (condo). Condos are like apartments, but each unit is usually owned by different people. They are usually cheaper than houses and you are usually not responsible for most of the maintenance.

EXAMPLE 3 – RENT VS. BUY?

- Gary's job is relocating to a new city and he plans to be there for at least 10 years. Gary is uncertain as to whether he should rent an apartment or buy a home while he is there, since he eventually wants to return to his home city. Gary wants to compare the total mortgage costs versus the total rental costs before making a decision. Gary knows that he can afford a monthly rent of $2,500. If he buys, he can put $100,000 down and take out a $350,000 mortgage for 20 years with an APR of 3.5%. Create a spreadsheet similar to the one created in Example 4 of Section 7-4 to assist Gary in making the comparison.

- SOLUTION:

- There are many factors that could enter into a comparison between renting and buying. In this case, you will only examine mortgage costs versus rental costs.

- Gary's yearly rent increase can be modeled using an exponential function. Let R represent the yearly rent, A represent his initial annual rent, B represent the rate of increase expressed as a percent, and D represent the year number.

$$R = A\left(1 + \frac{B}{100}\right)^{D-1}$$

	A	B	C	D
1	Renting			
2	Initial Rent	2,500		
3	Yearly Inflation Rate	2		
4		End of Year	Total Rent Paid for Year	Running Rent Paid
5		1	30,000	30,000.00
6		2	30,600.00	60,600.00
7		3	31,212.00	91,812.00
8		4	31,836.24	123,648.24
9		5	32,472.96	156,121.20
10		6	33,122.42	189,243.63

For example, suppose that Gary signs a contract for a monthly rent of $800 and the annual rate of increase is 2%.

In the formula, A equals the amount paid annually for rent. When you substitute a value for A, multiply the monthly rent by 12. The total rent paid is:

$$\text{First year} \quad R = 12 * 800 * (1 + 0.02)^{1-1} = 9,600 * (1.02)^0 = \$9,600$$
$$\text{Second year} \quad R = 12 * 800 * (1 + 0.02)^{2-1} = 9,600 * (1.02)^1 = \$9,792$$

Create a rental spreadsheet that has cells where the user can enter the initial monthly rent and the average yearly rent increase as shown in rows 2 and 3 in the spreadsheet below.

The first row, B5, after the table headings, should have the following entries.

B5	1	Begin with number 1.
C5	=12*$B$2*(11$B$3/100)^(B521)	Yearly rent
D5	=C5	Running rent paid

The second row should have the following entries.

B6	=B5+1	Adds 1 to each payment number.
C6	=12*$B$2*(11$B$3/100)^(B621)	Yearly rent
D6	=D5+C6	Running rent paid

Copy cells B6, C6, and D6 to create the spreadsheet values for 10 years.

EXAMPLE 3 – RENT VS. BUY? (CONTINUED)

EXAMPLE 3 – RENT VS. BUY? (CONTINUED)

From the first spreadsheet, Gary would pay a total of $328,491.63 in rent after 10 years. From the second spreadsheet, Gary would still owe the lending institution $205,727.91 after making 10 years' worth of payments. Out of his 120 payments, $144,727.20 would have gone to pay down the principal and $98,856.00 to interest on the loan. Gary's **equity** in the home would be $244,727.20

	A	B	C	D	E	F
1	Principal	$350,000.00				
2	Interest Rate as a Percent	3.5				
3	Length of Loan	20				
4	Number of Yearly Payments	12				
5	Payment Number	Beginning Balance	Monthly Payment	Towards Interest	Towards Principal	Ending Balance
6	1	$350,000.000	$2,029.86	$1,020.83	$1,009.03	$348,990
7	2	$298,778.94	$2,029.86	$1,017.89	$1,011.97	$347,979
124	119	$208,122.73	$2,029.86	$607.02	$1,422.84	$206,699

EXAMPLE 4 – IS IT WORTH IT?

- Jake and Gloria moved into an apartment and pay $1,900 rent per month. The landlord told them the rent has increased 4.1% per year on average. Express the rent y as an exponential function of the year number x that they are living in the apartment and determine the amount rent will be in their 13th year.

- SOLUTION:

Set up the exponential function you will enter where x is the monthly rent amount and x is the year number of Jake and Gloria's rental agreement.

$$y = 1,900(1 + 0.041)^{x-1}$$

- In 13 years, y = 1900(1.041)$^{13-1}$ = 1900(1.041)^{12} = **$3,077.20**

EXAMPLE 5 – SKIP IT ☺

ASSIGNMENT: PG 443 # 5, 7, 9, 12, 15

- #5

The Jacobs Family owned a condo in Bethpage Acres. They bought it for $130,000 six years ago and sold it last week for $195,000. Who keeps the profit from the sale? _____ ▼

- #7

Linda wants to purchase a Leisure Heights condominium. She will borrow $100,000 from the Duchess Savings Bank. The bank is presently offering a 30-year fixed rate mortgage with an APR of 4.1%. Her monthly maintenance fee will be $310.

a. What is the monthly mortgage payment to the nearest cent?

b. What will be her combined monthly payment?

ASSIGNMENT: PG 443 # 5, 7, 9, 12, 15 CON'T

- #9

- Helene and Vick moved into an apartment and pay $1,875 rent per month. The landlord told them that the rent has increased 3.28% per year on average. Express the rent y as an exponential function of the number of years they rent the apartment.

- #12

Monthly rent at Countryside Co-ops has increased annually, modeled by the exponential equation $y = 12(2,155)(1.062)^{x-1}$. What was the percent increase per year?

ASSIGNMENT: PG 443 # 5, 7, 9, 12, 15 CON'T

- #15

- Joe wants to rent an apartment with an initial monthly rent of $1,400. He has been told that the landlord raises the rent 1.25% each year. Set up an exponential function that models this situation. Calculate the rent after 12 years. Round to the nearest dollar.