Name _____ Date _____

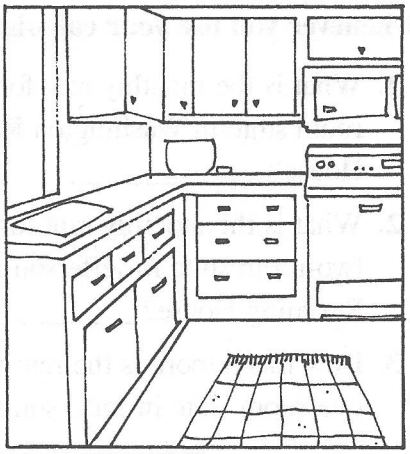
Problem Solving Application: Renting Apartments

Consumer: Renting Apartments

Statistics show that most young adults live in rental apartments.

When renting an apartment, you need to understand all the costs that are involved. The monthly rent is not your only cost. Usually, you also need to pay a security deposit. The security deposit may be equal to 1 or 2 months' rent.

In some apartment buildings, a charge for gas and electricity is included as part of the rent. In other buildings, you must pay the companies for the gas and electricity used.



Washington Rooming House: Close to Campus; Close to Work

=

More Cost-Effective than Renting an Apartment

Studio.....$275/mo
Two rooms.....$355/mo
Three rooms.....$440/mo
Four rooms.....$538/mo

Gas and electricity are included.
Security deposit: one month's rent

You decide to rent a single room in Washington Rooming House. How much money will you pay the owner in the first year?

THINK: In the first year, you will need to pay the security deposit plus 12 months' rent.

Step 1 Multiply to find the cost of 12 months' rent. $12 \times \$275 = \$3{,}300$

THINK: The security deposit is equal to 1 month's rent, or $275.

Step 2 Add to find the total amount. $\$275 + \$3{,}300 = \$3{,}575$

So, you will pay the owner $3,575 in the first year.

Name _____ Date _____

Here is similar information about Jefferson Manor Rooming House, a competitor. Use the information about the two rooming houses to answer the following exercises. Remember to estimate whenever you use your calculator.

Jefferson Manor Rooming House:
Clean, Convenient, and Affordable

Studio.....$316/mo
Two rooms.....$404/mo
Three rooms.....$498/mo
Four rooms.....$602/mo

Gas, electricity, and covered parking are included.
Security deposit: one month's rent

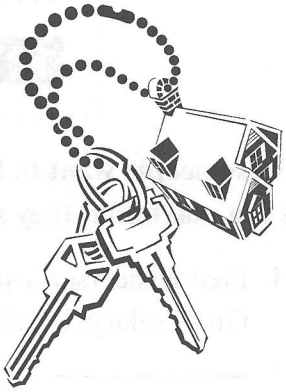
1. What is the monthly rent for a two-room suite in Washington Rooming House? _____
2. What is the monthly rent for a two-room suite in Jefferson Manor Rooming House? _____
3. How much more is the rent for a two-room suite in Jefferson Manor? _____
4. Does the rent for a two-room suite in Jefferson Manor include anything that is not included in the rent for a two-room suite at Washington Rooming House? If so, what? _____
5. Ann Ramirez has a two-room suite in Washington Rooming House. She bought a car and has to pay to park it nearby. Ann pays $40 a month to park her car. Does she pay more, all things considered, than she would pay to live at Jefferson Manor? _____
6. How much will Ann pay, in rent and parking, in six months (not including security deposit)? _____

Solve.

7. Jack O'Hara rents a two-room suite in Jefferson Manor. He stays for 8 months. How much rent does he pay in the 8 months? _____
8. Danica Diaz rents a three-room suite in Washington Rooming House. She stays one year. Three months into her stay, Danica buys a car. She arranges to park it for $25 a month. At the end of a year, Danica's deposit is returned to her. All things considered, how much has Danica spent during this year, to house herself and park her car? _____
9. In 3 months, Glen Rios pays a total of $1,494 in room rent. Where does he live, and how many rooms is he renting? _____
10. Which is a better deal for someone with a car: two rooms at Washington Rooming House with additional monthly parking of $50.00 a month? Or two rooms at Jefferson Manor? _____
11. John knows he needs three rooms and that he will have no more than $450 per month to spend on housing. He has a bike, but no car. Where can he get the best deal, Washington Rooming House or Jefferson Manor? _____

Name _____ Date _____

Buying a House



You know you will need to borrow money to buy a house. Before you look at houses, you should know the maximum you will be able to borrow and the maximum you will be able to spend for a house. In general, you should borrow no more than 2 times your annual gross income (though some mortgage lenders will tell you otherwise).

Example 1: You have saved $31,000 to buy a house. Your annual gross income is $48,600. What is the maximum you should be able to borrow? What is the maximum you should be able to spend for a house?

Step 1 Multiply to find the maximum you should borrow. $2 \times \$48,600 = \$97,200$

The maximum you can comfortably borrow is $97,200.

Step 2 Add to find the maximum you can spend. $\$97,200 + \$31,000 = \$128,200$

The maximum you should be able to spend on a house is $128,200.

You would like to buy a house that **appreciates** (increases in value) each year. The more the appreciation, the higher the future value of the house.

Example 2: Fran bought a house for $120,000. Her house appreciated 5% each year. What was the value of the house after 2 years?

Step 1 Multiply to find the first year's appreciation.
THINK: $5\% = 0.05$

$0.05 \times \$120,000 = \$6,000$

Step 2 Add to find the value after 1 year.

$\$120,000 + \$6,000 = \$126,000$

Step 3 Multiply to find the second year's appreciation.
THINK: Use the value after 1 year.

$\$126,000 \times 0.05 = \$6,300$

Step 4 Add to find the value after 2 years.

$\$126,000 + \$6,300 = \$132,300$

Step 5 Subtract to find the amount of appreciation.

$\$132,300 - \$120,000 = \$12,300$

After two years, Fran's house was worth $12,300 more than she paid for it.

Name _____ Date _____

Practice

TIP Remember to estimate whenever you use your calculator.

These people want to become homeowners. What is the maximum they can afford to borrow? What is the maximum they should be able to spend?

1. Fred Henderson's savings: $18,000
   Gross salary: $41,000 per year
   _____

2. Denise Chin's savings: $41,600
   Gross salary: $36,500 per year
   _____

3. Marge LaBeau's savings: $27,620
   Gross salary: $785 per week
   _____

4. Rafael Rodriguez's savings: $52,600
   Gross salary: $71,500 per year
   _____

5. Karen Goldblum's savings: $5,000
   Gross salary: $3,760 per month
   _____

6. The Militanos' savings: $24,409
   Gross salaries: Terri $37,200 per year;
   Frank $3,975 per month
   _____

Complete the table to find the appreciation and the value of each house.

Value	Yearly Rate of Appreciation	Appreciation in One Year	Value After One Year
$50,000	5%	7. _____	8. _____
$74,500	–3%	–$2,235	9. _____
$92,600	1%	10. _____	11. _____
$140,630	9%	12. _____	13. _____
$200,000	3%	14 _____	15. _____

Name _____ Date _____

Notice that not all the values in the table on page 88 are positive. If a house's value falls in a given year, this is called **depreciation**. The following table shows what happened to one house over a 5-year period. Complete the table.

Year	Value	Yearly Rate of Appreciation	Amount of Appreciation in that Year
Year 1	$250,000	−20%	−$50,000
Year 2	$200,000	**16.** _____	$0
Year 3	**17.** _____	4%	$8,000
Year 4	$208,000	**18.** _____	$4,160
Year 5	**19.** _____	0%	**20.** _____

Think About It

1. What factors do you think make a house appreciate or depreciate in value?

_____

_____

_____

More Practice

Solve.

1. Greg's house was valued at $45,500 in 1980. For two years, the house appreciated at a rate of 2% each year. What was the value after 2 years? _____
2. Lillian's house was valued at $170,500 in 2003. The house appreciated 6.5% each year. What was the value after 2 years? _____
3. Fawn's house in Connecticut was valued at $155,000 in 1981. The house appreciated 10% each year for the first 2 years. What was the value after 2 years? _____
4. Michelle's house was valued at $166,400. The house appreciated 9.5% each year. What was the value after 2 years? _____
5. Gene's house was valued at $248,200 when he bought it. The house appreciated at 12.5% per year for the next three years. What was the value after 3 years? (Round your answer to the nearest cent.)

_____

Name _____ Date _____

6. Hal and Donna's house in Anchorage was valued at $103,600 in 1988. The house depreciated at a rate of 2% per year (**THINK:** reduced in value by 2% per year), for the next 2 years. What was the house worth in 1990? _____

7. John and Sharon bought a house in Seattle in 2007 for $465,000. In 2008, it depreciated 10%. How much was the house then worth? _____

8. Janet bought a house for $358,000. The following year, it was worth only $304,300. At what rate did it depreciate that year? _____

9. Gary's house was valued at $582,500. For the next two years, it depreciated at a rate of 5% each year. What was it worth after 2 years? _____

10. Shauna's house was worth $140,000 when she bought it. It held its value for one year (i.e., neither appreciated nor depreciated), but the following year it lost 2% of its value. What was it worth after 2 years? _____

Extension **Appreciation**

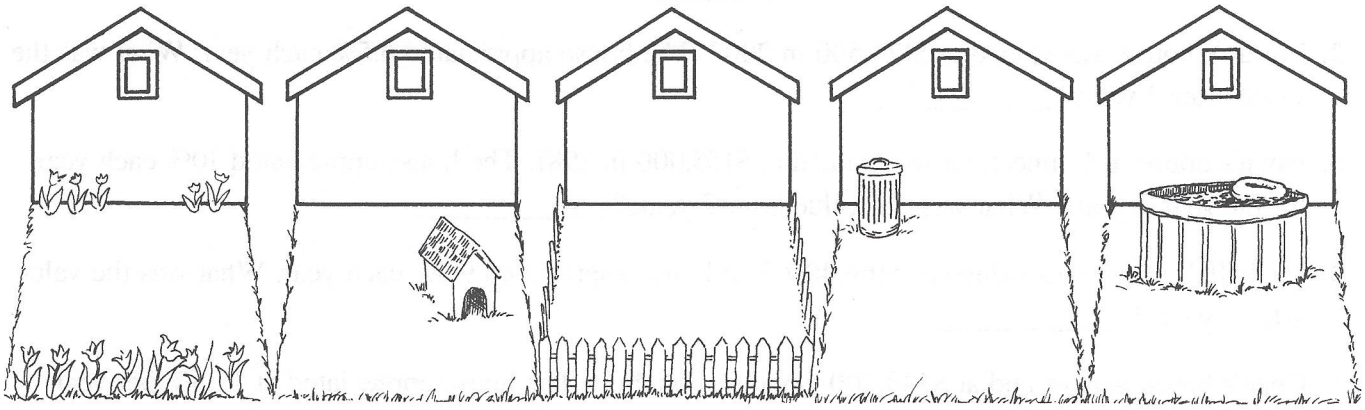
Just because a house costs more than another does not mean that it will be more valuable in the future. Ed bought a house for $53,900. It appreciated 13% each year. Eileen bought a house for $61,000. It appreciated 6% each year.

1. Which house was worth more after 2 years?

_____

2. If the houses keep appreciating in the same way, what will the difference in value be in 5 years?

_____



Name _____ Date _____

Getting a Mortgage

The loan you get to buy a house or a condominium is called a **mortgage**. The **principal and interest ("P&I")** portion of your monthly mortgage payment depends on the amount you borrow, the **interest rate**, and the total number of payments (the mortgage **term**).

Mortgage rates go up or down as a result of a variety of economic factors. In 1985, some 30-year mortgages had an interest rate of almost 12%. In 2010, the rate was closer to 5%, or even less. Rates vary a bit by region, and housing prices differ, as well.

Example 1: Your parents bought a house when they were first married. It cost $82,750. They put 20% down and borrowed the remainder at 10.5% for 30 years. What was the **down payment** and the mortgage amount? How much did they pay each month?

Step 1 Multiply to find the down payment.

(**THINK:** 20% = 0.2)

0.2 × $82,750 = $16,550

The down payment was $16,550.

Step 2 Subtract to find the mortgage amount.

$82,750 − $16,550 = $66,200

The mortgage amount was $66,200.

Step 3 Divide to find how many $1,000 you are borrowing.

$66,200 ÷ $1,000 = 66.2

Step 4 Multiply to find the monthly payment.

(**THINK:** Use the mortgage payment table. Find the monthly payment per $1,000, or $9.15.)

66.2 × $9.15 = $605.73

They paid $605.73 per month.

MORTGAGE PAYMENTS PER $1000			
Interest Rate	Monthly Payment		
	20-y loan	25-y loan	30-y loan
5.0%	$6.60	$5.85	$5.37
5.5%	$6.88	$6.14	$5.68
6.0%	$7.16	$6.44	$6.00
6.5%	$7.46	$6.75	$6.32
7.0%	$7.75	$7.07	$6.65
7.5%	$8.06	$7.39	$6.99
8.0%	$8.36	$7.72	$7.34
8.5%	$8.68	$8.05	$7.69
9.0%	$9.00	$8.40	$8.05
9.5%	$9.33	$8.74	$8.41
10.0%	$9.66	$9.09	$8.78
10.5%	$9.99	$9.45	$9.15
11.0%	$10.33	$9.81	$9.53
11.5%	$10.66	$10.16	$9.90
12.0%	$11.01	$10.53	$10.29
12.5%	$11.36	$10.90	$10.67
13.0%	$11.72	$11.28	$11.06
13.5%	$12.07	$11.66	$11.45
14.0%	$12.44	$12.04	$11.85
14.5%	$12.80	$12.42	$12.25
15.0%	$13.17	$12.81	$12.64
15.5%	$13.54	$13.20	$13.05

Name _____ Date _____

The **closing** is the day on which you sign the mortgage papers and the contract. You will have to pay **closing costs** to the bank and others who helped process the mortgage. Included in these costs are whatever **points** you have agreed to pay. You can sometimes reduce your interest rate by paying points "up front," which means at closing. Each point is 1% of the mortgage amount.

Example 2: Your parents' mortgage amount was $66,200. Their closing costs were $2\frac{1}{2}$ points, plus $250 for the bank's attorney, and a $185 title fee. How much were their closing costs?

(**THINK:** $2\frac{1}{2}$ points $= 2\frac{1}{2}\% = 0.025$)

Step 1 Multiply to find the points. $0.025\% \times \$66{,}200 = \$1{,}655$

Step 2 Add to find the closing costs. $\$1{,}655 + \$250 + \$185 = \$2{,}090$

Their closing costs were $2,090.

Think About It

1. How could you estimate the extra cost per month of borrowing $50,000 for 30 years at 11% instead of 10%?

_____

_____

_____

Practice

Using the table, find the monthly payment on the following mortgages to the nearest cent.

Mortgage amount	Interest Rate	Term	Monthly payment
$145,000	10.5%	30 y	1. _____
$98,000	11.5%	25 y	2. _____
$220,000	6%	20 y	3. _____
$175,000	5%	30 y	4. _____
$114,000	8.5%	30 y	5. _____

Name _____ Date _____

For the following mortgages, calculate the down payment amount, the mortgage amount, and the monthly payment:

Purchase Price	% Down	Down payment	Mortgage amt.	Interest rate	Term	Monthly payment
$124,000	20%	**6.** _____	**7.** _____	10.5%	30 y	**8.** _____
$89,700	10%	**9.** _____	**10.** _____	10.0%	20 y	**11.** _____
$93,620	30%	**12.** _____	**13.** _____	11.0%	25 y	**14.** _____
$79,840	15%	**15.** _____	**16.** _____	9.5%	30 y	**17.** _____

Find the closing costs.

Mortgage amount	Points	Attorney's Fees	Title Fees	Closing Costs
$37,000	3	$750	$300	**18.** _____
$57,000	1	$900	$250	**19.** _____
$109,500	4	$840	$175	**20.** _____
$96,450	2½	$575	$375	**21.** _____
$88,750	3½	$465	$305	**22.** _____

When housing costs go up and rates go down, the numbers look a little different.

Calculate down payment, mortgage amount, and monthly payment for these higher purchase prices with lower interest rates:

Purchase Price	% Down	Down payment	Mortgage amt.	Rate	Term	Monthly payment
$189,000	20%	**23.** _____	**24.** _____	5.5%	30 y	**25.** _____
$289,700	10%	**26.** _____	**27.** _____	5.0%	20 y	**28.** _____
$393,000	30%	**29.** _____	**30.** _____	6.0%	25 y	**31.** _____
$479,000	25%	**32.** _____	**33.** _____	6.5%	30 y	**34.** _____

Name _____ Date _____

Extension **Using Bank Websites**

Most banks post their rates at their websites. Their rates vary, not in increments of 0.5%, as in the table on page 95, but in increments of 0.125% (an eighth). Use the table to answer the questions that follow. The example uses a 30-year fixed-rate mortgage.

Using the table, find the monthly payment on the following mortgages to the nearest cent.

Assume the term of the mortgage is 30 years.

1. $145,000 at 5% _____
2. $98,000 at 6.875% _____
3. $220,000 at 5.625% _____
4. $175,000 at 5.375% _____
5. $114,000 at 6.125% _____
6. $151,200 at 5.25% _____
7. $260,750 at 6.375% _____
8. $275,100 at 7% _____
9. $359,250 at 5.5% _____
10. $100,000 at 5.875% _____

MORTGAGE PAYMENTS PER $1000	
Interest Rate	Monthly Payment 30-y loan
5.0%	$5.37
5.125%	$5.44
5.25%	$5.52
5.375%	$5.60
5.5%	$5.68
5.625%	$5.76
5.75%	$5.84
5.875%	$5.92
6.0%	$6.00
6.125%	$6.08
6.25%	$6.16
6.375%	$6.24
6.5%	$6.32
6.625%	$6.40
6.75%	$6.49
6.875%	$6.57
7.0%	$6.65