Elements of Consumer Math

By: Leon Kriston

v 1.0
INSTRUCTIONS

Welcome to your Continental Academy course “Elements of Consumer Math”. It is made up of 11 individual lessons, as listed in the Table of Contents. Each lesson includes practice questions with answers. You will progress through this course one lesson at a time, at your own pace.

First, study the lesson thoroughly. Then, complete the lesson reviews at the end of the lesson and carefully check your answers. Sometimes, those answers will contain information that you will need on the graded lesson assignments. When you are ready, complete the 10-question, multiple choice lesson assignment. At the end of each lesson, you will find notes to help you prepare for the online assignments.

All lesson assignments are open-book. Continue working on the lessons at your own pace until you have finished all lesson assignments for this course.

When you have completed and passed all lesson assignments for this course, complete the End of Course Examination.

If you need help understanding any part of the lesson, practice questions, or this procedure:

- Click on the “Send a Message” link on the left side of the home page
- Select “Academic Guidance” in the “To” field
- Type your question in the field provided
- Then, click on the “Send” button
- You will receive a response within ONE BUSINESS DAY
Leon Kriston is a true Midwesterner. He was a Chicago suburb resident whose education was also received in the mid west. He has a B.S. in Mathematics from Purdue University and a J.D. degree from Illinois Institute of Technology / Chicago-Kent College of Law. Mr. Kriston taught for 30+ years at Bloom Township High School, where he became a Dean. He also taught both Mathematics and Law courses at Prairie State and South Suburban colleges. While he did all this, Mr. Kriston managed a career in the practice of Real Estate Law.

He then retired and moved to South Florida where he currently resides and tutors math students.
Development of skills in problem solving, communication, reasoning, and connections as related to consumer services and personal financial management.

- Student will understand numbers, ways of representing numbers, relationships among numbers, and number systems
- Students will compute fluently and make reasonable estimates
- Students will solve problems the arise in mathematics and in arguments about its relationship
- Student will know how to apply transformations and use symmetry
- Student will understand patterns, relations, and functions
- Student will use the language of mathematics to express mathematical ideas precisely
- Students will solve problems that arise in mathematics and in other contexts
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LESSON 1: PERSONAL FINANCE-Job-related Mathematics
Hourly pay /Overtime

**Straight-time pay**
- **Straight-time pay** = your hourly rate of pay times the hours worked.

In order to calculate your **straight-time pay** (the total amount you earn for a week), Multiply your **hourly rate** times the **hours worked**.

<table>
<thead>
<tr>
<th>Example: You have worked 35 hours and you make $8.35 an hour.</th>
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<tbody>
<tr>
<td>$8.35 (hourly rate) × 35 (hours) $8.35 × 35 = $292.25</td>
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</tbody>
</table>

**Overtime pay**
- Overtime pay = overtime rate of pay times the number of hours of overtime worked. Any hours over 40 hours are considered overtime hours. Your **overtime rate of pay** might be called **time and a half** or **double-time**.

<table>
<thead>
<tr>
<th>Example : You worked 43 hours and you make $8.00 per hour</th>
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<tbody>
<tr>
<td>43 total hours - 40 regular hours = 3 overtime hours</td>
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</tbody>
</table>

Your overtime rate is your regular hourly rate times either **time and a half or Double-time**.

- $8.00 × 1 \frac{1}{2}$ or $8.00 x 1.5 = $12.00 overtime rate of pay
- $8.00 x 2$ (double time) = $16.00 overtime rate of pay

To calculate overtime pay: multiply overtime rate of pay times overtime hours.
Weekly Pay / Time Card
Weekly pay will equal regular pay plus overtime pay. In order to calculate weekly pay, you will need to find the number of hours you worked from your time card. You will then need to determine if you have worked overtime.

Time Card

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<thead>
<tr>
<th>Date</th>
<th>In</th>
<th>Out</th>
<th>In</th>
<th>Out</th>
<th>Hours</th>
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<tbody>
<tr>
<td>12/19/06</td>
<td>8:15</td>
<td>12:15</td>
<td>1:00</td>
<td>5:00</td>
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</tbody>
</table>

- \(12:15 - 8:15 = 4\)
- \(5:00 - 1:00 = 4\)
- \(4 + 4 = 8\)

- Start with “out” time and subtract “in” time to calculate hours worked.
- If start time is before 1:00 and end time is 1:00 or later, you must add 12:00 to the end time.

Example: In: 8:00 Out: 2:00

\[2:00 + 12:00 = 14:00\]

\[14:00 - 8:00 = 6:00\] hours worked

Salary / Commission
If you are not paid an hourly wage; then you will be paid a salary.

- You will be paid weekly, biweekly (every two weeks), or monthly.
- Your salary per pay period will be calculated by taking your annual salary and dividing by the number of pay periods.
• If you work as a sales person, you most likely will be paid a base salary plus **commission**.
• Your commission will be calculated as a percentage of the amount of sales that you have made.

**Example:** Your weekly salary is $250.00 plus a 6% commission of your total sales of $4,250.00.

- Calculate your salary: $250.00 (weekly salary) + (6% commission x $4,250 sales) + (0.06 x 4,250 = $255.00)
  - $250.00 + $255.00 = $505.00 total salary for that week.

**Remember:** percentages **MUST** be changed to decimals.
- 6% = 0.06
- 25% = 0.25
- 120% = 1.20

**Key Terms and Concepts**
- Straight - time pay
- Overtime pay
- Overtime rate of pay
- Salary
- Commission

**PROBLEMS**

**Straight-time pay**

1. You have worked 35 ½ hours and your hourly rate of pay is $10.75.
   - Calculate your straight - time pay.
     - a. $381.00  
     - b. $382.00  
     - c. $381.63  
     - d. $381.36
**Overtime pay**

2a You have worked 48 hours. **Calculate hours of overtime.**
   a. 8   b. 7   c. 6   d. 5

2b. You get paid time and a half and your regular rate of pay is $9.00.
   **Calculate your overtime rate of pay.**
   a. $11.00   b. $12.00   c. $13.00   d. $13.50

2c. **Calculate amount of overtime pay.**
   a. $105.00   b. $106.00   c. $107.00   d. $108.00

**Weekly pay / time card-** Employee Time Card

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<tr>
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<th>Out</th>
<th>In</th>
<th>Out</th>
<th>Hours</th>
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<tr>
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<td>8:30</td>
<td>12:30</td>
<td>12:30</td>
<td>5:30</td>
<td></td>
</tr>
</tbody>
</table>

Your hourly rate of pay=$12.00 and overtime rate of pay is time and a half (1½)

**Using the above time card:**

3a. **Calculate the hours.**
   a. 43   b. 42   c. 41   d. 40

3b. **Calculate regular pay.**
   a. $400.00   b. $450.00   c. $480.00   d. $490.00

3c. **Calculate overtime pay.**
   a. $52.00   b. $54.00   c. $56.00   d. $58.00

3d. **Calculate total pay.**
   a. $530.00   b. $531.00   c. $534.00   d. $535.00
Salary / Commission

4. Your annual salary is $28,450.00. Find your monthly salary.
   a. $2,400.00  b. $2,370.83  c. $2,300.00  d. $2,270.83

5. Your weekly salary is $375.00 plus 6 ½ % of total sales of $3800.00
   Calculate your salary.
   a. $622.00  b. $623.00  c. $624.00  d. $625.00

ANSWERS

Straight - time pay
1. 35 ½ changes to 35.5  Hourly rate x number of hours = pay  C
   $10.75 x 35.5 = $381.625  Round answer to $381.63

Overtime pay
2a. 48 hours - 40 = 8 hours overtime  A
2b. 1 ½ x $9.00 hourly rate  (1.5 x $9.00 = $13.50)  D
2c. 8 x 1.5 x $9 = $108.00 overtime  D

Weekly pay / time card
3a. Employee Time Card  A

<table>
<thead>
<tr>
<th>Day</th>
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<th>Total Hours</th>
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<td>Mon</td>
<td>12:15 - 8:15 = 4hrs</td>
<td>5:00 - 1:00 = 4hrs</td>
</tr>
<tr>
<td>Tue</td>
<td>12:30 - 8:30 = 4hrs</td>
<td>Add 12 to 5:50 because In time is before 1</td>
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<tr>
<td></td>
<td>17:50 - 5:50 = 5hrs.</td>
<td>(4hrs + 5hrs = 9hrs)</td>
</tr>
<tr>
<td>Wed</td>
<td>12:05 - 8:05 = 4hrs</td>
<td>16:30 - 12:30 =4hrs</td>
</tr>
<tr>
<td>Thu</td>
<td>13:15 - 8:15 =5hrs</td>
<td>6:15 - 2:15 = 4hrs</td>
</tr>
<tr>
<td>Fri</td>
<td>12:30 - 8:30 = 4hrs</td>
<td>17:30 - 12:30 = 5hrs</td>
</tr>
</tbody>
</table>

hours are 8+9+8+9+9 = 43
Elements of Consumer Mathematics

3b. regular time pay is 40 x $12 = $480

3c. 1.5 x $12 = $18 per hr of overtime

$18 x 3 hours of overtime = $54 overtime pay

3d. total pay is $480 + $54 = $534.00

Salary/Commission

4. monthly $28,450 / 12 = $2370.833 round to $2370.83

5. $375.00 + 6 1/2% x $3800.00 = salary

.065 x $3800 = $247.00 commission

$375 salary + $247 commission = $622.00 total salary
LESSON 1 THINGS TO REMEMBER

**Straight-time pay = your hourly rate of pay times the hours worked.**
Multiply your hourly rate times the hours worked. If you worked 38 ¾ hours at an hourly rate of $10.00 per hour, your straight time pay would be $387.50 (38.75 hrs. x $10/hr.)

**Overtime pay = overtime rate of pay times the number of hours of overtime worked.**
Any hours over 40 hours are considered overtime worked. Your overtime rate could be time and a half or maybe double time. If you worked 43 hours in a week and your rate of pay is normally $10/hour, your overtime hours are 43-40= 3 hours. (1) At time and half, your overtime rate of pay is $15 per hour ($10 X 1 ½) x 3 hours = $45. (2) If your overtime rate is double time, your overtime rate of pay is 2 X $10 or $ 20 per hour; $20 X 3 hours = $60 overtime pay.

Your regular pay is $400 (40 hours x $10/hour) and your total pay in (1) is $400 + $45 = $445, and in (2) your total pay would be $400 + $60 = $460.

**SALARY PLUS COMMISSION-** Your weekly salary is $250.00 plus a 6% commission of your total weekly sales of $4,250.00. Calculate your salary.

$250.00 (weekly salary ) + (6% commission x $4,250 sales) + (.06 x 4,250 = $255.00) $250.00 + $255.00 = $505.00 total salary for that week. Remember: percentages MUST be changed to decimals.

6% = .06 25% = .25 120% =1.20

Your yearly salary is $36,000 plus 40% of your total sales of $200,000. What is your monthly salary?

$36,000/12 months = $3,000 per month.
$.40 X $200,000 = $80,000
$80,000/12 months = $6,666.67 month.

Monthly salary would be $ 3,000 = $6,666.67 = $9
LESSON 2: PERSONAL INCOME/TAX—Federal Taxes

As you know, Federal Income Tax is deducted from your wages. The amount deducted depends upon your marital status, the number of children you have and the amount you are earning. The government gives you one allowance for yourself, one for your spouse, and one for each child or person you support.

You need to read a table to find your wages, the number of deductions, and finally the amount of money to be withheld from your paycheck.

*Notice in the following table, a person making between $330 and $340, claiming 0 deductions, will have $18.00 deducted. Reading across the table, you will find that the amount deducted goes down as the number of deductions increases.*

MARRIED Persons—WEEKLY Payroll Period (For Wages Paid in 2007)

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Publication 15 (January 2007)
Elements of Consumer Mathematics

Your employer will not only withhold income tax, but also social security and Medicare. If you make over $25.00 but not over $500.00 weekly, the amount of tax withheld will be 15%.

**Example:**

If you make $350.00 each week, find 15% of $350 to arrive at the amount of tax withheld.

15% of 350 is what amount?-------- Change 15% to a decimal--------0.15
0.15 of $350 is what amount? The word “of “ means to multiply
0.15 times $350 is what amount? The word “is “ means equals
0.15 x $350 = $52.50 amount deducted from each weekly pay check.

If you use a calculator, the problem would be entered as follows;

- Enter(350) Enter (times) Enter (15) Enter (% key) = $52.50 answer

**Review**

- There are only three types of percentage problems! Every percentage problem will look like the following examples.
- You will either multiply or divide to get the answer.
- All percentage problems have a percent, the word “of “, a number following “of “, the word “is “ and another number.

**Problem #1  Multiply ×**

50% of $400 is $200
50% of $400 is what amount?
0.50 x $400 = $200 amount
Problem # 2  Divide  

50 % of what number is $200?

0.50 x what number = $200

You can’t multiply because 0.50 times “what number “ Cannot be done!
So, divide $ 200 by 0.50-----$200 / 0.50 = $400

Problem #3  Divide  

What % of $400 is $200?

? % x $400 = $200

Can’t multiply ? X 400......so divide 200 by 400

200 / 400 = 0.50

Change 0.50 to a %........ 0.50 = 50%

State income tax
You may live in a state (like Florida) that has no state income tax. Most states however; collect a state income tax. The state income tax, like Federal Income Tax, depends on how much you earn, your marital status and the number of dependants ( children ) you support.

To calculate your state income tax you will subtract the allowances for dependants from your annual pay. Next, that result will be multiplied by the state tax rate. Most states follow the Federal Tax Codes and allow $1500 per allowance.
Social Security / Medicare Taxes

These two taxes are collected by your employer for the Federal government. The two taxes will show as deductions on your pay stub.

Social Security is taxed at a rate of 7.0 %. Medicare is taxed at a rate of 1.65%. Here is a place where you add percents.

\[7.0 \% + 1.65 \% = 8.65 \% \text{ total tax deductions}\]

As you can see, your employer will take 8.65 % of you check for Social Security / Medicare and will put it under a label written as FICA.

Example:
For one week your gross pay is $1500. Multiply that by 8.65 %.

\[1500 \times 0.0865 = 129.75\]
Health Insurance

One more deduction from your pay check will be for health insurance, if your employer offers it. Your employer will most likely pay for a part of the cost and you as the employee will pay the rest.

The amount you pay will depend on the percent your employer pays.

If your employer pays 60 % of the annual cost, you will pay 40 %.

100 % - 60 % = 40 %

Example:
The annual cost for health insurance for each employee is $3700. If you are to pay 40 % of the cost, then

\[ 40 \% \times \$3700 = \$1480 \]

The $1480 will then be divided by the number of pay checks to determine the amount deducted from each of your pay checks. If you are paid every two weeks, then

\[ 52 \text{ weeks} / 2 = 26 \text{ paychecks.} \]

\[ \$1480 / 26 = \$56.92 \]

$56.92 will be deducted from each of your paychecks.

Key Terms

<table>
<thead>
<tr>
<th>Income tax</th>
<th>Allowances</th>
<th>Social Security</th>
<th>Medicare</th>
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PROBLEMS

1. Using “Married Persons Tax Table” find the payroll deduction for a person making between $480 and $490 and having 2 deductions
   - a. $20
   - b. $30
   - c. $40
   - d. $50

2. 38% of $750 is what amount?
   - a. $255.00
   - b. $355.00
   - c. $290.00
   - d. $285.00

3. 27% of what number is $337.50
   - a. $1150.00
   - b. $1250.00
   - c. $1350.00
   - d. $1450.00

4. What percent of $375 is $67.50
   - a. 17 %
   - b. 19 %
   - c. 18 %
   - d. 20%

5. State Income Tax: Joe Smith earns $37,500. He is single (one deduction). Tax rate is 3 %. Calculate the tax.
   - a. $1000.00
   - b. $1080.00
   - c. $1090.00
   - d. $2000

   - a. $570.00
   - b. $580.00
   - c. $590.00
   - d. $560.00

7. Social Security: Gross pay = $135. Calculate FICA deduction
   - a. $10.00
   - b. $11.25
   - c. $11.68
   - d. $12.00

8. Gross pay = $1675. Calculate the FICA deduction
   - a. $141.89
   - b. $142.89
   - c. $143.89
   - d. $144.89
9. Annual group insurance costs $3750. The company pays 50% of the costs. You get paid monthly. What will be deducted from your check?
   a. $156.25       b. $155.25       c. $156.50       d. $160.00

10. Annual group insurance costs $6,000. The company pays 75% of the costs. You get paid weekly. What will be deducted from your check?
    a. $28.50        b. $28.60        c. $28.85        d. $28.75

ANSWERS

1. Look at fifth column over on the line that lists 480—490 and you should get $20    A

2. 38% of $750 is what amount?        D
    0.38 x $750 = $285

3. 27% of what number is 337.50    B
    0.27 x what number = $337.50  $337.50 / 0.27 = $1250
    Check 27% of $1250 = $337.50

4. What % of $375 is $67.50 ?        C
    What % x $375 = $67.50  $67.50 / $375 = 0.18  0.18 = 18 %

5. State Income Tax    B
    $37,500 - $1500 ( one deduction ) = $36,000 taxable wage
    $36,000 x 3% = Tax  $36,000 x 0.03 = $1080
6. Janice Smith

Married----- 2 allowances
one child-----1 allowance

3 total allowances  $1500 x 3 = $4,500 allowance

Income - allowance = taxable income
$42,500  - $4,500 = $38,000 taxable income

$38,000 x 1 ½% = State income tax  $38,000 x 0.015 = $570.00 answer

7. Social security

$135 x 8.65%   = FICA deduction
$135 x 0.0865 = $11.6775 round to------$11.68

8. $1675 x 8.65 %

$1675 x .0865 = $144.8875 rounded to—$144.89 FICA deduction

9. Health Insurance

$3,750 annual cost  100%  - 50% = 50% your cost
$3,750 x 50% = your cost $3,750 x 0.50 = $1,875

$1,875 / 12 = $156.25 deducted monthly

10. $6,000 annual cost  100%  - 75% = 25% your cost
$6,000 x 25% = your cost $6,000 x 0.25 = $1,500

$1,500 / 52 = $28.846153  round to-----$28.85 weekly deduction
LESSON 2 THINGS TO REMEMBER

PERCENTAGE PROBLEMS

38% of $750 is what amount?

0.38 x $750 = $285

27% of what number is $337.50?

0.27 X what number = $337.50

$337.50 / 0.27 = $1250

PERSONAL INCOME TAX

Joe Smith earns $37,500. He is single (one deduction). Tax rate is 3 %. The exemption for one deduction is $1500. Calculate the tax.

$37,500 - $1500 (one deduction) = $36,000 taxable wage

$36,000 x 3% = Tax

$36,000 x 0.03 = $1080

Janice Smith earns $42,500.00. Married with one child. Tax is 1 ½%.

Married-- 2 allowances; one child--1 allowance = 3 allowances

$1500/allowance x 3 allowances = $4,500 total allowance

Income - allowance = taxable income

$42,500 - $4,500 = $38,000 taxable income

$38,000 x 1 ½% = $38,000 x 0.015 = $570.00

Joe Smith earns $37,500. He is married. Tax rate is 3 %. Calculate the tax.

Married-- 2 allowances; $1500/allowance X 2 = $3000 total allowance. Income - allowance = taxable income

$37,500 - $3000 = $34,500 taxable income

$34,500 x 3% = Tax

$34,500 x 0.03 = $1,035 tax

SOCIAL SECURITY AND MEDICARE TAXES

These two taxes are collected by your employer

Social Security FICA : Gross pay = $135 Calculate FICA deduction

$135 x 8.65% = FICA deduction

$135 x 0.0865 = $11.6775 round to------$11.68
Gross pay = $1675  Calculate the FICA deduction
$1675 x 8.65 %
$1675 x .0865 = $144.8875 rounded to—$144.89 FICA deduction

**ANNUAL GROUP HEALTH INSURANCE**

Some employers provide health insurance where you pay part and the employer pays part. The deduction is taken out with your other deductions.

Assume annual group insurance costs $3750. The company pays 50% of the costs. You get paid monthly. What will be deducted from your check?

Health Insurance

$3,750 annual cost 100% - 50% = 50% your cost
$3,750 x 50% = your cost $3,750 x 0.50 = $1,875
$1,875 / 12 = $156.25 deducted monthly

Annual group insurance costs $6,000. The company pays 75% of the costs. You get paid weekly. What will be deducted from your check?

You get paid weekly. What will be deducted from your check?

$6,000 annual cost 100% - 75% = 25% your cost
$6,000 x 25% = your cost $6,000 x 0.25 = $1,500
$1,500 / 52 = $28.846153 round to-----$28.85 weekly deduction
LESSON 3: RETIREMENT

In this lesson you will see a table giving interest rates and the years it will take to double the amount of money invested at that rate. You will most likely want to retire one day.

The Federal government will send you a statement showing your FICA account. You will need to supplement your FICA retirement with pension funds from your place of work.

In addition to FICA and pension benefits, you can save and invest. Some company pensions will pay a percentage of your wages after you work for the company for a stated number of years.

For example, a company agrees to pay upon retirement 60% of the average of your last five years earnings. You earn the following: $30,000, $28,000, $32,000, $34,000, and $35,000 for your last five years.

\[
30,000 + 28,000 + 32,000 + 34,000 + 35,000 = 159,000
\]

\[
159,000 / 5 \text{ years} = \$31,800 \text{ average salary}
\]

\[
\$31,800 \times 60\% = \$19,080
\]

The company will pay you $19,080 per year in retirement.

If you have worked enough years (quarters) to earn $12,800 from Social Security, then pension plus Social Security will give you a retirement annually of $31,880. If you do not get a company pension, but will earn $12,800 from Social Security, plan to live 20 years beyond retirement and want to have annual retirement of $31,880, you must have saved 20 years \( \times \$19,080 = \$381,600 \).
Using the following table:

**Interest Rate vs. Doubling Time**

- 5%  14.2 years
- 7%  10.2 years
- 9%  8 years
- 11% 6.6 years

If you had $5,000 at age 30 invested at 11%

$ 5,000 → $10,000 in 6.6 years
$ 10,000 → $20,000 in 6.6 years
$ 20,000 → $40,000 in 6.6 years
$ 40,000 → $80,000 in 6.6 years
$ 80,000 → $160,000 in 6.6 years
$160,000 → $320,000 in 6.6 years

39.6 years total

In approximately 40 years you would have $320,000 and could retire at 70. Or you could retire at 65 with less money.

**Key Terms**

| Retirement | Pension |
PROBLEMS

1. You are age 30, and start with $6,000. After 39.6 years, at 11%, how much money will you have?
   a. $384,000.00   b. $385,000.00   c. $320,000.00   d. $400,000.00

2. You are age 33, and start with $10,000. In 40 years at 9%, how much money would you have accumulated?
   a. $300,000.00   b. $310,000.00   c. $320,000.00   d. $330,000.00

Your last five years of annual earnings are $40,000, $42,500, $43,000, $43,500 and $44,000. Find the average of these salaries. Your company has agreed to pay you 80% of this as your annual pension. What is your annual pension? Social Security has notified you that you will receive $1,200 a month. What will your total pension amount to?

3. Find the average of these salaries.
   a. $42,500.00   b. $42,600.00   c. $42,700.00   d. $42,800.00

4. Using the above information, what is your annual pension?
   a. $34,050.00   b. $34,060.00   c. $34,070.00   d. $34,080.00

5. Using the above information, what is your total monthly pension?
   a. $4,040.00   b. $4,050.00   c. $4,060.00   d. $4,070.00

6. Using the above information, what is your total pension (yearly)?
   a. $49,480.00   b. $48,480.00   c. $50,480.00   d. $47,480.00
7. If, you get $1200 a month in social security, what do you receive annually?
   a. $14,100.00  b. $14,200.00  c. $14,300.00  d. $14,400.00

Your average salary for the last five years before you retire is $45,500.00.
Your company will pay you 75% of this for retirement.

8. What is your annual retirement?
   a. $33,125.00  b. $32,125.00  c. $34,125.00  d. $35,125.00

9. Using the above information, what is your monthly retirement?
   a. $2,900.00  b. $2,843.75  c. $3,043.75  d. $2,743.75

10. Using the above information, what is your weekly retirement?
   a. $656.25  b. $657.25  c. $658.25  d. $659.25

   **ANSWERS**

1. Using Doubling table

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<td>$24,000</td>
<td>6.6 years</td>
</tr>
<tr>
<td>$24,000</td>
<td>$48,000</td>
<td>6.6 years</td>
</tr>
<tr>
<td>$48,000</td>
<td>$96,000</td>
<td>6.6 years</td>
</tr>
<tr>
<td>$96,000</td>
<td>$192,000</td>
<td>6.6 years</td>
</tr>
<tr>
<td>$192,000</td>
<td>$384,000</td>
<td>6.6 years</td>
</tr>
<tr>
<td>$384,000-------</td>
<td>39.6 years</td>
<td></td>
</tr>
</tbody>
</table>

30
2. Using Doubling table

$10,000 doubles to 20,000 In 8 years
$20,000 doubles to 40,000 In 8 years
$40,000 doubles to 80,000 In 8 years
$80,000 doubles to 160,000 In 8 years
$160,000 doubles to 320,000 In 8 years

$320,000-------> 40 years

3. $213.00 / 5 = $42,600 average for last 5 years

4. $42,600 x 80% = annual pension

$42,600 x 0.80 = $34,080

5. $34,080 / 12 = $2,840 monthly pension

$2,840 + $1,200 (social security) = $4,040 total pension monthly

6. $4,040 x 12 months = $48,480 yearly pension

7. $1,200 x 12 months = $14,400.00

8. $45,500.00 x 0.75 = $34,125.00

9. $34,125.00 / 12 = $2843.75

10. $34,125.00 / 52 = $656.25
LESSON 3 THINGS TO REMEMBER

INTEREST RATE AND DOUBLING TIME
Money invested at an interest rate of 11% will double in 6.6 years. If you had $5,000 dollars at age 30 invested at 11% it will double to $10,000 in 6.6 years; $20,000 in 13.2 years etc. In 39.6 years the original $5,000 would be worth $320,000.

FINDING AVERAGES
If you spend $5.00, $6.00, $7.00, $8.00, and $9.00 for lunch what is your average expenditure for lunch?

Add the 5 amounts ($35.00) and divide by 5 = $7.00

You have an average salary of $60,000 for the last 5 years you have worked. Your employer’s retirement will pay you 75% a year and your Social Security benefit comes to $2000 per month. What will your monthly retirement income be? 75% of $60,000 is $45,000 per year or $3,750 per month plus $2,000 a month Social Security = $5,750 a month retirement income or pension income.
LESSON 4: BUDGETING

Recording Expenditures

A budget is a plan for using money to best meet your wants and needs.
Remember, there is a difference between wants and needs.
I may want a “BMW” but I may need a “KIA” to get to work.

In order to use your money to best meet your wants and needs, you will need to record your expenditures. Recording your spending should allow you to meet your needs and have money to spend on some of your wants. Your record keeping will show you how much you have spent and then it can be compared to your earnings.
You cannot spend more than you earn!
Well, maybe you can, but you should not!

Look at your pay stub and write down your net pay, the actual money available to spend.

Net pay = Gross pay - Deductions
If you get paid every two weeks, multiply your net pay by two and you have your monthly net pay.

Next, record your spending daily, weekly, and monthly for one month. If you spend exactly or slightly less than your net pay, you should budget. Record everything you spend, even $0.25 on gum. Record within an hour of spending or you will lose track of your spending.
Budget / Budgeting

Any monthly budget will consist of:

- **living expenses**,  **fixed expenses**, and **annual expenses**.

**Living expenses** will vary month to month and will cover food, clothing, etc.

**Fixed expenses** such as rent, car payments, and mortgage payments do not vary month to month.

**Annual expenses** (which could be paid monthly) include insurance (life, car ), membership dues and real estate taxes.

Your task will be to place all recorded expenses into one of these categories.

Your **total monthly expenses** will be the sum of the **monthly living expenses** plus **monthly fixed expenses** plus the monthly part of the annual expenses.

---

Example:

You spend $5.75, $6.25, $3.90, $4.85, $6.55 on daily lunches. Find the daily average spent on lunches. Add the five amounts and divide by five.

\[
$27.30 / 5 = $5.46 \text{ average daily lunch}
\]

If you multiply this by 20 (5days x 4 weeks )

\[
$5.46 \times 20 = $109.20 \text{ monthly spent on lunches}
\]

At the end of the month, if you have actually spent $125.00 on lunches you have overspent.

\[
$125.00 - $109.20 = $15.80 \text{ overspent}
\]
Example:
You and your spouse have monthly living expenses of $1,875.00, monthly fixed expenses of $2,700.00, and annual expenses of $6,900.00. Find your total monthly expenses.

1st. $6,900 annual / 12 = $575 monthly part of annual
2nd. $1,875 living
 $2,700 fixed
 $ 575 Annual monthly
 $5,150 total monthly

PROBLEMS
1. $27.50, $33.00, 35.00, $29.00 have been spent every week for four weeks on gasoline. Find the average weekly gas expenditure.
   a. $31.13          b. $35.00          c. $35.10          d. $23.52

2. You have budgeted $135.00 for gasoline for the month. Are you on budget?
   a. Yes       b. No

3. You spent $250.00 for one year of dry cleaning. Find the monthly average.
   a. $20.00       b. $20.83       c. $21.83       d. $22.83
4. This month you spent $25.00 on dry cleaning. Are you under average?
   a. Yes  b. No

Your net pay for two weeks is $775.00

5. Using the above information, find your yearly net.
   a. $19,150.00  b. $21,150.00  c. $20,150.00  d. $22,150.00

6. Using the above information, find your monthly net.
   a. $1,679.17  b. $1,700.00  c. $1,500.00  d. $1,779.17

7. You spent $19,001.75 for the year. Did you spend more than you made?
   a. Yes  b. No

8. Monthly living expenses = $1,885
   Monthly fixed expenses = $2,478
   Annual expenses = $4,700
   Find the monthly total expenses
   a. $4,754.00  b. $4,744.67  c. $4,754.67  d. $4,760

9. Monthly living expenses = $885
   Monthly fixed expenses = $1,478
   Annual expense = $3,700
   Find the monthly total expenses
   a. $2,600.00  b. $2,670.00  c. $2,671.33  d. $2,700.00

10. Monthly living expenses = $585
    Monthly fixed expenses = $1,078
    Annual expense = $2,700
    Find the monthly total expenses
    a. $1,800.00  b. $1,880.00  c. $1,888.00  d. $2,000.00
ANSWERS

1. \( \$124.50 / 4 = \$31.125 \rightarrow \) round to \$31.13 A

2. You budgeted \$135.......you spent \$124.50... UNDER A

3. \( \$250.00 / 12 = \$20.833 \rightarrow \) round to \$20.83 B

4. This month you spent \$25. You are over the average. B

5. \$775 for 2 weeks \( \times \) 26 pay periods = \$20,150.00 C

6. \$20,150.00 / 12 = \$1679.17 A

7. Made \$20,150.00 B
   
   Spent \$19,001.75  Did NOT spend more than was made.

8. \$4,700/12 = \$391.67 One month of annual expenses
   
   Monthly living expenses \$1,885.00
   Monthly fixed expenses \$2,478.00
   One month of the Annual expenses \$391.67
   total monthly \$4,754.67 C
9. $3,700/12 = $308.33 One month of annual expenses
   $885.00   Monthly living expenses
   $1,478.00  Monthly fixed expenses
   +$308.33  One month of the Annual expenses
   $2,671.33  total monthly expenses

10. $  585.00   Monthly living expenses
    $1,078.00  Monthly fixed expenses
    $  225.00  One month of the Annual expenses
    $1,888.00  total monthly expenses
LESSON 4 THINGS TO REMEMBER

BUDGETING/MONTHLY EXPENSES

If you spent $360 in one year for dry cleaning, what was the monthly average? Divide the yearly amount by 12 months to get $30 per month average.

If your net pay for two weeks is $1000, what would your yearly net pay be?

First determine how many two week pay periods there are in a year. (52 weeks in a year divided by 2 yields 26 pay periods.) Multiply the number of pay periods, 26, times the 2 week net pay, $1000, to come up with $26,000 yearly net pay. With your net pay of $26,000, you spend $25,400. Are you under budget or over budget? You are under budget by $600. You have that amount left over.

If you budget $40 per week for gasoline, what is your budgeted yearly expense? (52 weeks in a year times $40 per week yields $2080 gasoline budget.

If your take home pay is $30,000 per year, how much do you have available to spend every month? Divide the yearly take home pay of $30,000 by 12 months to yield $2,500 per month.

In order to find your total monthly expenses, add up your all your expenses. Remember, your total expense of any item for a year, divided by 12 will yield your monthly expense. And your monthly expense for any item multiplied by 12 will result in your yearly expense for that item.
LESSON 5: PURCHASE AND SALE OF GOODS AND SERVICES

Sales Tax

Almost all states charge a sales tax. In addition, some states allow sales taxes to be charged by county and city governments. As you have most likely noticed, once again we are going to deal with per cents.

Example: You live in a state charging 6% sales tax. You have purchased $2,375 of goods or services. How much sales tax is to be added?

$2,375 x 6% =??  $2,375 x 0.06 = $142.50

It is now time to look at a new method to calculate per cents.

New method------------------> Proportion

The per cent (6%) will be written as a fraction. Six per cent means six per 100.

6%—> 6 / 100  2.9%-----> 2.9/100

The amount of the sales tax will be the numerator of a second fraction------> ST

The amount purchased will be the denominator of the second fraction. ST / $2,375

- Now write an equation making the two fractions equal

\[
\frac{6}{100} = \frac{ST}{2375} \quad \quad \frac{6}{100} = \frac{ST}{2375}
\]

Notice the second fraction has the numerator “ST” (amount of sales tax).

Since you do not know this amount, this is an equation with one unknown..

- Multiply diagonally----> 6 times 2375 And 100 times ST

You now can write an equation: 14,250 = 100 ST

- Now divide both sides by 100:

\[
\frac{14,250}{100} = 100ST \quad \quad \frac{142.50}{100} = \frac{ST}{100}
\]

Your sales tax (ST) is $142.50 and you have solved the equation.
One more example: Find the sales tax (at 2.9%) charged on $575 in sales.

\[
\frac{2.9}{100} = \frac{ST}{575}
\]

- Multiply diagonally and you now have: \[100ST = 1667.50\]
- Now divide both sides by 100 and you will have the sales tax.

\[
\begin{align*}
100ST &= 1667.50 \\
\frac{100ST}{100} &= \frac{1667.50}{100} \\
ST &= \$16.675
\end{align*}
\]

Notice the sales tax is $16.675 and will be rounded up to $16.68.

You now have a choice when asked to find a per cent of a number.

\[
\% \text{ (of) number} = ( \text{is} ) \text{ an amount} \quad \text{or} \quad 6\% \text{ of } \$50 \text{ is how much?}
\]

<table>
<thead>
<tr>
<th>New method:</th>
<th>[\frac{6}{100} = \frac{\text{amount}}{50} \rightarrow \frac{100(\text{amount})}{100} = $300]</th>
<th>Amount = $3.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old method:</td>
<td>[0.06 \times $50 = \text{amount} \rightarrow $3.00 = \text{amount}]</td>
<td></td>
</tr>
</tbody>
</table>

Notice: the word “of” means multiply and the word “is” means equal.

**Unit Price**

If you want to be a comparison shopper (a bargain buyer), you must know how to find and compare unit prices.
Markdowns / Markups

If a product has been marked down it has been reduced in price. This reduction in price is also called a discount. Many stores have sales and mark downs or will discount items 10%. 20%, 30%, etc.

Example:

A dress has a price tag of $79.99. It is on sale at a 20% discount. What is the sales price or the price you pay at the cash register?

\[
\frac{20}{100} = \text{discount} \quad \text{---->} \quad \frac{100(\text{discount})}{100} = \frac{1599.80}{100} \quad \text{------> discount} = $16.00
\]

Sales price is $79.99 - $16.00 = $63.99

The opposite of a markdown is a markup. If you run your own business and sell products, you will mark up your products. You will try to sell each item for more than you paid for it so that you can pay your business expenses.

Unit price = Price of item / Weight or count

Example:

Coffee 1 pound (lb.) $2.99 2 pounds (lbs.) $5.50

Unit price------> $2.99/1lb. = $2.99 $5.50/2 lbs. = $2.75/lb

$2.75 for one pound is cheaper than $2.99; therefore, buying 2lbs for $5.50 is the better buy!
Example: You buy a product for $160.00 and your business model tells you to markup your product 60%.

60% of $160 is “Mark Up”  
\[ 0.60 \times 160 = \text{96 Markup} \]

Or

\[
\frac{60}{100} = \frac{\text{markup}}{160} \implies 100(\text{markup}) = 9600 \implies \frac{100(\text{markup})}{100} = \frac{9600}{100}
\]

\[ \text{Markup} = 96 \]

Now add your price and $96----> $160 + $96 = $256

This is your selling price for this product.

### Key Terms

<table>
<thead>
<tr>
<th>Sales Tax</th>
<th>Sales Price</th>
<th>Unit Price</th>
<th>Markup</th>
<th>Markdowns</th>
</tr>
</thead>
</table>

### PROBLEMS

State sales tax 6%: City sales Tax 1%; Purchase $980

1. Calculate city sales tax.
   a. $9.80  
   b. $7.80  
   c. $10.80  
   d. $8.80

2. Calculate state sales tax.
   a. $57.80  
   b. $56.80  
   c. $58.80  
   d. $55.80

3. Calculate total purchase price.
   a. $1038.60  
   b. $1058.60  
   c. $1068.60  
   d. $1048.60
Unit price

4. One brand of mushrooms sells for $1.99 for a 12-ounce can, and another is $1.79 for a 10-ounce can. Which is the best buy?
   a. 12 oz. Can  b. 10 oz. Can

5. A shampoo comes in two sizes...a 12-fl. oz. Bottle that costs $3.32, and a 20 fluid ounce bottle for $5.80. Which is the better buy?
   a. 12 -fl -.oz. b. 20 -fl-.oz.

A gallon of paint is marked $24.99. The clerk tells you paint is on sale at a 30% discount. Find the discount and the sales price.

6. Find the discount.
   a. $6.50 b. $7.50 c. $5.50 d. $8.50

7. Find the sales price.
   a. $16.49 b. $15.49 c. $17.49 d. $18.49

Your business buys a product for $199.99. Your business model tells you to mark it up 35%. How much is the mark up? How much will you sell it for?

8. How much is the mark up?
   a. $60.00 b. $70.00 c. $80.00 d. $50.00

9. How much will you sell it for?
   a. $239.99 b. $249.99 c. $259.99 d. $269.99
10. A computer is on sale. The price tag shows $200.00 marked down to $160.00 and take an additional 30% off at the register. Find the final sales price.

- a. $110.00
- b. $112.00
- c. $113.00
- d. $109.00

ANSWERS

1. City sales tax 1%

\[
\frac{1}{100} = \text{ST} / 980
\]

\[
100\text{ST} = 980 \rightarrow \frac{100\text{ST}}{100} = \frac{980}{100} \rightarrow \text{ST} = \text{\$9.80 city sales tax}
\]

2. State Sales tax is 6%

\[
\frac{6}{100} = \text{ST} / 980
\]

\[
100\text{ST} = 5880 \rightarrow \frac{100\text{ST}}{100} = \frac{5880}{100} \rightarrow \text{ST} = \text{\$58.80 state tax}
\]

3. $980.00 purchase price + $68.60 total sales tax = $1048.60 total price

Alternate Solution: $980.00 purchase price + 7% total sales tax

4. $1.99/12 ounces = $0.16583 per ounce

$1.79/10 ounces = $0.179

Round to —> $0.17 per ounce

The 12 ounce can is the better buy (cheaper).

5. $3.32/12 fl. oz. = $0.2766 per fluid ounce

$5.80/20 oz. = $0.29 per fl. oz.

Round to —> $0.28 per fluid ounce

The 12 fluid ounce bottle is the better buy (cheaper).
6. \[ \frac{30}{100} = \text{discount} / \$24.99 \quad \text{100 discount} = 749.70 \]
\[ \frac{100 \text{ discount}}{100} = 749.70 \quad \text{Discount} = \$7.497 \text{ round to } \rightarrow \$7.50 \]

7. \$24.99 - \$7.50 = \$17.49 \text{ sales price}  

8. \[ 0.35 \times 199.99 = \$69.9965 \text{ round to } \rightarrow \$70.00 \]

9. \$199.99 + \$70.00 = \$269.99 \text{ sales price}  

10. \[ 0.30 \times \$160 = \$48.00 \text{ additional discount} \]
\[ \$160.00 - \$48.00 = \$112.00 \text{ sales price} \]
Lesson 5 Things to Remember

Purchase price of an item times the rate of sales tax results is the amount of sales tax.

If the price of an automobile is $30,000 and the sales tax is 7%:
$.07 times $30,000 = $2,100.

The total cost of the above automobile purchase is $30,000 + $2,100 = $32,100.

Total sales tax is always the total of all your taxable items times the sales tax rate.

Unit price of an item is determined by taking the total cost of the item and dividing it by the number of units. If 3 pounds of coffee cost $6.75, the per pound cost is $6.75 divided by 3 which is equal to $2.25 a pound.

In order to compare the same product in different size containers, you must find the per unit cost in order to make a comparison. If a 13 ounce bag of coffee cost $3.90 and a 16 ounce bag costs $4.96 which is less expensive? You have to find the per ounce cost in each case. $3.90 divided by 13 ounces = $.30 per ounce. $4.96 divided by 16 ounces = $.31 per ounce. The 13 ounce bag is less expensive.

An MP3 player is on sale. The sales tag shows $200 marked down to $160. The tag says take an additional 40% off at the register.
What is the additional discount? $160 times .40 = $64.
What is the final sales price for the above MP3 player? $160 - $64 = $96.

A high end product costs your business $1000. Your policy states that you mark up the item 65%. What is the price you will charge?
$1000 times .65 = $650. $1000 + $650 = $1650.

75% of what number is 450? .75 X? = 450? = 450/.75 = 600

? % of $800 is $480? ? = $480/$800 = .60 = 60%
LESSON 6: COST OF CREDIT- Charge Accounts

A **charge account** is a “line of credit” at a given place of business (i.e. Sears, Burdines, etc.). A **credit card** allows the holder to purchase goods and services at any place of business. Both of these forms of credit charge a fee for the use of their services. That fee is called a **finance charge**. The finance charge is calculated by multiplying the unpaid balance by a Periodic rate of interest.

Most companies that provide charge accounts and/or credit cards send monthly statements. This statement shows payments, credits, charges, and the current unpaid balance. It also shows the current payment due, which is usually a minimum payment. Most cards charge a minimum of $10.00 or 2% of the unpaid or outstanding balance.

**Example**

If you owe $675.00 on the card, your minimum payment due is $675 \times 0.02 = $13.50. In this case, the $13.50 is greater than the usual $10.00.......so you must pay $13.50. If your balance is under $500.00, then 2% would be less than $10, but you will still have to pay $10.00 and not less.

**Here’s a hint.** Always make payments much larger than the minimum required. Whenever possible pay cash for things and/or pay off balances every month. If you make only minimum payments on an account it would take years to pay off the account.
You would also pay many additional dollars in interest over your beginning charges. If you must use credit, use it wisely.

**Finance Charges**

Finance charges are calculated as follows: **Unpaid balance x periodic rate**

Here are two periodic rates taken from two statements, one a charge card and one a credit card

<table>
<thead>
<tr>
<th>#1 Daily Periodic Rate</th>
<th>#2 Daily Periodic Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05918%</td>
<td>0.01068%</td>
</tr>
</tbody>
</table>

Multiply by 30 days to get the monthly rate and then by 12 to get the yearly rate.

- 0.05918 x 30 = 1.7754%
- 0.01068 x 30 = 0.3204%

- 1.7754 x 12 = 21.3048%
- 0.3204 x 12 = 3.8448

21.30% yearly rate
3.84% yearly rate

Which card would you prefer to use?

Using rate #1
1.7754% monthly periodic rate
& an unpaid balance of $1,228
Finance charge = 1.7754% x $1228
—> $21.81

Using rate #2
0.3204% monthly periodic rate
& the same unpaid $1,228
Finance charge = 0.3204% x $1228
----> $3.94

**Loans**

Consumer loans are available from banks and credit unions. There are two types of consumer loans, single-payment loans and installment loans.
A **single-payment loan** is a loan which you pay with a single payment after a specific period of time. It will consist of the amount borrowed and interest.

The interest is calculated by the formula—> \( \text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time} \)

### Example:

You have a single-payment loan for $6,500 for 90 days at 11% annual interest. What is the amount of money due at the end of the 90 days?

<table>
<thead>
<tr>
<th>Interest</th>
<th>=</th>
<th>Principal</th>
<th>×</th>
<th>Rate (annual)</th>
<th>×</th>
<th>Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>=</td>
<td>$6,500</td>
<td>×</td>
<td>11%</td>
<td>×</td>
<td>90 days/1 year</td>
</tr>
<tr>
<td>Interest</td>
<td>=</td>
<td>$6,500</td>
<td>×</td>
<td>0.11</td>
<td>×</td>
<td>90/360 year</td>
</tr>
</tbody>
</table>

90/360 can be reduced —> 9/36 = ¼ of a year

**Or changed to a decimal** 90/360 = 0.25 of a year

<table>
<thead>
<tr>
<th>Interest</th>
<th>=</th>
<th>$6,500</th>
<th>×</th>
<th>0.11 annually</th>
<th>×</th>
<th>0.25 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>=</td>
<td>$178.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using a calculator you would: 6500 x .11 x .25 = 178.75

Money Due = $6,500.00 (amt. Borrowed) + $178.75 (interest) = $6678.75

**Installment loans** require you to make the same payment or installment every month until the amount borrowed and the interest due are repaid during the time period requested.

The interest collected here is always on the **unpaid** balance (after your last payment). It **cannot be** calculated by Interest = Principal x Rate x Time
You will need a computer program or a table generated by a computer to look up the payment. Most payment tables will give a payment based upon $100; $1000; or $10,000 borrowed. If you have a computer, a program may be a part of your software package. If you have an online service (AOL, Prodigy, etc.) you can get access to programs. For the purposes of this course, a table is on the following pages.

♦ Use the table to look up the monthly payment for a $100 loan.
♦ Divide the total amount of the loan by 100.
♦ Multiply that answer by the monthly payment for a $100 loan.
♦ To get the total amount that must be repaid, multiply the number of payments times the monthly payment.
Example: What is the monthly payment and interest on an installment loan of $6,000 for 48 months at 16%?

1. Look in the table to find the monthly payment for a $100 loan. ($2.83)

2. Divide the amount of the loan by 100

   \[ \frac{6000}{100} = 60 \]

3. Multiply that 60 by the monthly payment for a $100 loan, $2.83.

   \[ 60 \times 2.83 = \text{Monthly payment} \]
   \[ 169.80 = \text{Monthly payment} \]

   \[ \frac{\text{Amount of loan}}{100} \times \text{monthly payment for $100 (found in table)} = \text{monthly payment} \]

4. Multiply $169.80 (monthly payment) times 48 months of this loan.

   \[ 169.80 \times 48 = \text{total amount to be repaid} \]
   \[ 8,150.40 = \text{total amount to be repaid} \]

   \[ \text{Total amount to be repaid} = \# \text{ of payments} \times \text{monthly payment} \]

Finally:

Interest (finance charge) = Total amount to be repaid - Amount of the loan

\[ \text{Interest} = 8,150.40 - 6,000 \]

\[ \text{Interest} = 2,150.40 \]

This is the cost of this loan. When comparing loans of the same amount with the same number of payments, always look carefully at the Annual Percentage Rate (APR), not at other statements of finance charges. Federal law requires that the APR be included in every loan document.
Monthly Payment on a Simple Interest Installment Loan of $100

<table>
<thead>
<tr>
<th>Term in months</th>
<th>Annual Percentage Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.00% 9.00% 10.00% 11.00% 12.00% 13.00% 14.00% 15.00% 16.00%</td>
</tr>
<tr>
<td>6</td>
<td>17.06 17.11 17.16 17.21 17.25 17.30 17.35 17.40 17.45</td>
</tr>
<tr>
<td>12</td>
<td>8.70 8.75 8.79 8.84 8.88 8.93 8.98 9.03 9.07</td>
</tr>
<tr>
<td>18</td>
<td>5.91 5.96 6.01 6.05 6.10 6.14 6.19 6.24 6.29</td>
</tr>
<tr>
<td>24</td>
<td>4.52 4.57 4.61 4.66 4.71 4.75 4.80 4.85 4.90</td>
</tr>
<tr>
<td>30</td>
<td>3.69 3.73 3.78 3.83 3.87 3.92 3.97 4.02 4.07</td>
</tr>
<tr>
<td>36</td>
<td>3.13 3.18 3.23 3.27 3.32 3.37 3.42 3.47 3.52</td>
</tr>
<tr>
<td>42</td>
<td>2.74 2.78 2.83 2.88 2.93 2.98 3.03 3.07 3.12</td>
</tr>
<tr>
<td>48</td>
<td>2.44 2.49 2.54 2.58 2.63 2.68 2.73 2.78 2.83</td>
</tr>
<tr>
<td>54</td>
<td>2.21 2.26 2.31 2.36 2.41 2.46 2.51 2.56 2.61</td>
</tr>
<tr>
<td>60</td>
<td>2.03 2.08 2.12 2.17 2.22 2.28 2.33 2.38 2.43</td>
</tr>
</tbody>
</table>

Key Terms

charge account  finance charge  consumer loans
single-payment loan  installment loan

PROBLEMS

Charge accounts

1. Your unpaid balance is $1,275.00. Calculate your minimum payment (2%).
   a. $22.00  b. $25.50  c. $20.00  d. $26.00

2. Your unpaid balance is $5,275.00. Calculate your minimum payment (2%).
   a. $105.50  b. $110.50  c. $107.50  d. $111.00


**Finance charges**

You have a 1.75% monthly periodic rate and unpaid balance of $875.

3. Find the finance charges.
   
   a. $15.11  
   b. $15.21  
   c. $15.31  
   d. $15.41

4. Find the yearly rate of interest.
   
   a. 18%  
   b. 19%  
   c. 20%  
   d. 20%

You have a 2.25 % monthly periodic rate and unpaid balance of $1,575.00.

5. Find the finance charges.
   
   a. $35.42  
   b. $35.43  
   c. $35.44  
   d. $35.45

6. Find the yearly rate of interest.
   
   a. 27%  
   b. 28%  
   c. 29%  
   d. 30%

**Loans** - A single-payment loan has a Principal of $650, an annual rate 10%, and lasts for time 180 days.

7. Calculate interest due.
   
   a. $32.25  
   b. $32.50  
   c. $32.75  
   d. $32.00

8. Calculate repayment amount
   
   a. $682.00  
   b. $682.10  
   c. $682.25  
   d. $682.50
An Installment loan $2,460, 12 months, 15% interest.

9. Find the monthly payment. Use the table.
   a. $222.14      b. $222.50      c. $222.65      d. $222.75

10. Find the cost of the loan.
    a. $205.00      b. $205.68      c. $205.78      d. $205.98

ANSWERS

1. 2% of $1275 = minimum payment
   0.02 x $1275 = $25.50   B

2. 2% of $5275 = minimum payment
   0.02 x $5275 = $105.50   A

3. 1.75% of $875 = finance charges
   0.0175 x $875 = $15.31   C

4. 1.75% x 12 (months) = 21%  D

5. $1575 x 2.25% = finance charges
   $1575 x 0.0225 = $35.4375 round to —> $35.44   C

6. 2.25% x 12(months) = 27 %  A

7. $650 x 10% X 180/360 = Interest
   $650 x 0.10 X 0.5 = $32.50   B

8. $650 + $32.50 = $682.50 repayment amount  D

Installment Loans

9. $2460/100 = $24.60
   $24.60 x $9.03 = $222.138
   The $9.03 comes from table, term 12 months, 15%
   Round $222.138———> $222.14 monthly payment  A

10. $222.14 x 12 = $2665.68 total amount
    $2665.68 - $2460.00 = $205.68 interest  B
**LESSON 6 THINGS TO REMEMBER**

**Daily periodic interest.** The daily periodic interest rate is the Annual Percentage Rate (APR) divided by 12 (to give you a monthly rate) and then divided by 30 to arrive at the daily periodic rate. If the Annual Percentage Rate is 24%, changing 24% to .24 and divide by 12 to obtain a monthly rate of .02 then divide by 30 to obtain the daily periodic rate of .0666%.

**Single Payment Loans.** A single-payment loan is a loan that you pay with a single payment after a specific period of time. It will consist of the amount borrowed and interest.

The interest is calculated by the formula—> Interest = Principal x Rate x Time.

**Example:**

You have a single-payment loan for $6,500 for 90 days at 11% annual interest. What is the amount of money due at the end of the 90 days?

<table>
<thead>
<tr>
<th>Interest</th>
<th>=</th>
<th>Principal</th>
<th>X</th>
<th>Rate (annual)</th>
<th>X</th>
<th>Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>=</td>
<td>$6,500</td>
<td>X</td>
<td>11%</td>
<td>X</td>
<td>90 days/1 year</td>
</tr>
<tr>
<td>Interest</td>
<td>=</td>
<td>$6,500</td>
<td>X</td>
<td>0.11</td>
<td>X</td>
<td>90/360 year</td>
</tr>
</tbody>
</table>

90/360 can be reduced —> 9/36 = ¼ of a year

Or changed to a decimal 90/360 = 0.25 of a year

<table>
<thead>
<tr>
<th>Interest</th>
<th>=</th>
<th>$6,500</th>
<th>X</th>
<th>0.11 annually</th>
<th>X</th>
<th>0.25 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>=</td>
<td>$ 178.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using a calculator you would: 6500 x .11 x .25 = 178.75

Money Due = $6,500.00 (amt. Borrowed) + $178.75 (interest) = $6678.75
Installment loans require you to make the same payment or installment every month until the amount borrowed and the interest due are repaid during the time period requested.

**Example:** What is the monthly payment and interest on an installment loan of $6,000 for 48 months at 16%?

1. Look in the table to find the monthly payment for a $100 loan. ($2.83)
2. Divide the amount of the loan by 100
   \[ 6000 / 100 = 60 \]
3. Multiply that 60 by the monthly payment for a $100 loan, $2.83.
   \[ 60 \times 2.83 = \text{Monthly payment} \]
   \[ 60 \times 2.83 = 169.80 = \text{Monthly payment} \]
   \[ \text{Amount of loan} / 100 \times \text{monthly payment for $100 (found in table)} = \text{monthly payment} \]
4. Multiply $169.80 (monthly payment) times 48 months of this loan.
   \[ 169.80 \times 48 = \text{total amount to be repaid} \]
   \[ 8150.40 = \text{total amount to be repaid} \]
   \[ \text{Total amount to be repaid} = \# \text{ of payments} \times \text{monthly payment} \]
LESSON 7: BANKING SERVICES-Checking Accounts

A checking account allows you the holder to write checks against the money that you have deposited into it.

- Any check that you write, when it is received by your bank, directs the bank to pay the amount on the check.
- In order for this to work, you must keep more money in the account than you cause to be withdrawn by writing checks or making cash withdrawals from an ATM.
- In order for that to happen you must keep very accurate records of deposits (money put into the account) and withdrawals (checks, automatic payments, ATM).

You will keep records accurate and up to date by doing the appropriate arithmetic (addition and subtraction).

If you do not keep accurate account of your money and overdraw your account, the bank will deny payment to the check holder and assess you a penalty. The late fees and overdrawn fees could be costly and a waste of money.

You will use a check register to keep track of checks written and deposits made. In the check register you will do the appropriate additions and subtractions to keep an up to date balance. In the following graphic, you will see a blank copy of a typical check register.
You do not need to use every line. Use the white lines to record checks and the darker lines to record deposits.

You see, it is easy to find deposits, just look at the dark lines. You will add deposits to the current balance and you will subtract check amounts from the current balance.

You will see, in the following examples, this could be tedious, but it is necessary to do the additions and subtractions in a timely manner. If you keep up with the arithmetic, you will always know your balance and should not overdraw your account or “bounce” a check.

When you use an ATM you must know your estimated check register balance. When many people use an ATM, they first check their account balance to see how much money is available for withdrawal.
Then their account becomes overdrawn the next day because the ATM balance does not reflect written checks that have not yet cleared.

Example:

<table>
<thead>
<tr>
<th># or code</th>
<th>Transaction Description</th>
<th>Amt</th>
<th>Dep</th>
<th>Bal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check 101</td>
<td>Food</td>
<td>$ 68.75</td>
<td></td>
<td>$280.97</td>
</tr>
<tr>
<td>Check 102</td>
<td>Gas</td>
<td>$ 45.53</td>
<td></td>
<td>$280.44</td>
</tr>
<tr>
<td>Check 103</td>
<td>Phone</td>
<td>$ 59.69</td>
<td></td>
<td>$220.75</td>
</tr>
<tr>
<td>Check 104</td>
<td>Visa</td>
<td>$103.34</td>
<td>Deposit</td>
<td>$45.00</td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td></td>
<td></td>
<td>$349.72</td>
</tr>
</tbody>
</table>

The check register for these transactions should look like the following.

<table>
<thead>
<tr>
<th># or code</th>
<th>Transaction Description</th>
<th>Amt</th>
<th>Dep</th>
<th>Bal</th>
</tr>
</thead>
<tbody>
<tr>
<td>#101</td>
<td>Food</td>
<td>$ 68.75</td>
<td></td>
<td>$280.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$45.00</td>
<td>$325.97</td>
</tr>
<tr>
<td>#102</td>
<td>Gas</td>
<td>$ 45.53</td>
<td></td>
<td>$280.44</td>
</tr>
<tr>
<td>#103</td>
<td>Phone</td>
<td>$ 59.69</td>
<td></td>
<td>$220.75</td>
</tr>
<tr>
<td>#104</td>
<td>Visa</td>
<td>$103.34</td>
<td></td>
<td>$117.41</td>
</tr>
</tbody>
</table>

Register is up to date......As you can see:

$349.72 - $68.75 = $280.97  
$280.97 + $45.00= $325.97

Subtract checks <--------> Add Deposits

Check registers are not kept up to date mostly because the arithmetic is not always done at the moment the check is written and then recorded.
You might skip doing the arithmetic to leave it for later. Then you will probably stop doing it altogether. Finally, you will bounce checks. Overdraw your account. Get late fees and overdraft charges.

The following example shows a quick method to get a balance. Then, later, you spend time either by hand or with a calculator to get the exact balance. When you use the quick method you will enter the exact amount rounded to the tens place.

**Example:**
$89.95 is the exact amount. Rounding to the tens place gives $90. You will look at the ones place to decide to round up or round down.

- If your number is 85, 86, 87, 88, or 89, you will round to 90
- If your number is 81, 82, 83, or 84, you will round to 80

Using the previous example, this is what the quick method will give you:
As you can see $120 quick balance and $117.41 actual balance (look back at previous check register).

Hopefully, you can see rounded numbers can be quickly added or subtracted. You will record an exact balance later after you carry a quick balance for a few checks. Remember, the quick method for five or six checks. Then, the exact balance should be entered when you move to another page in the register. Now you can use the quick method and keep your own register up to date.

**Quick review on rounding up or rounding down:**

$73.94----> ones digit less than 5.....round this number down----> $70 tens digit

$77.05—> ones digit is greater than 5…….round number up------>$80 tens digit.

Notice the tens digit goes up or down based upon what the ones digit is.
Savings Accounts

- A savings account is a way of paying yourself.
- Every month or every two weeks **you get paid**.
- Then you start writing checks and paying other people for food, gas, rent and/or mortgage.
- The first check you write or the first automatic transfer should be to yourself in the form of a deposit into a savings account.
- Almost all books on personal finance or any self-help books on money management tell you that you must save.
- The consensus among most financial sources is that Americans are poor savers.
- To manage your money successfully and make it work for you, a savings account should be part of your financial plan.

If you already have a checking account, the most convenient place to have a savings account would be at the same bank that you have the checking account. But, convenience should not be your first consideration.

A savings account is one that pays interest. Thus, you should put your money with the bank that pays the highest and thus the best interest rate.

Banks used to pay just simple interest calculated by the following equation:

Simple Interest = Principal \times Time
Example 1:

Principal $1200.00, kept in a bank at Annual Interest Rate 3%, for 1 year

Interest earned = $1200 \times 0.03 \times 1\text{ (year) } = \$36.00

If you use a time period of less than a year, for example six months; it must be written as a fraction of a year. \( \frac{6}{12} = \frac{1}{2} \) or 0.5

Example 2:

$1200 saved in a bank for 6 months at Annual Interest of 3%

Interest earned = $1200 \times 0.03 \times \frac{6}{12} = \$18.00

Without reducing you would multiply $1200 times 0.03 times 6 and finally divide by 12. Reducing \( \frac{6}{12} \) you would multiply $1200 \times 0.03 \times 1 \text{ and then divide by } 2 = \$18.00 . \text{ If the time period was days:}

you would make a fraction over 365----->Interest earned for 15 days = \$1200 \times 0.03 \times \frac{15}{365} = \$1.479 \text{ round } \$1.48. Most banks pay compound interest.

**Compound interest** is interest paid on the original amount and also on the interest that was earned from previous periods.

Example 3:

Find the compound interest on $1200 at 3% annual interest rate compounded semi-annually

$1200 \times 0.03 \times \frac{6 \text{ months}}{12 \text{ months}} = \$18.00 \text{ interest}

- Add the principal $1200 to $18 interest -----> new principal $1218

Next time period of \( \frac{6}{12} \)-----> $1218 \times 0.03 \times \frac{6}{12} = \$18.27

- Add principal $1218 to 2\text{nd semi-annual interest of } \$18.27 \text{ and you get } \$1236.27 \text{ as an end of the year balance}
If you subtract the starting balance (principal) $1200 from the ending balance $1236.27—> $1236.27 - $1200 = $36.27 is the compound interest for one year figured semi-annually or twice a year. Compare that to the interest for one year with NO compounding, $36.00 (Example 1).

If you were compounding monthly, there would be twelve calculations. Weekly compounding would require fifty-two calculations Daily compounding would require three sixty-five calculations.

The more frequently the interest is compounded, the more the interest is earned. Nobody does this many calculations. With computers these calculations can be done quickly. There are also compound interest tables. The tables show a principal, many different interest rates, and time periods. If you were to use the table for daily compounding, you would look up the number of days, the rate and find a number. You would then multiply your principal times the number in the table.

<table>
<thead>
<tr>
<th>Key Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking accounts</td>
</tr>
<tr>
<td>Balance</td>
</tr>
<tr>
<td>Quick method</td>
</tr>
<tr>
<td>Savings account</td>
</tr>
<tr>
<td>Check register</td>
</tr>
<tr>
<td>Compound interest</td>
</tr>
</tbody>
</table>
PROBLEMS

1. Enter the following items in a check register of your own keep a running balance. Find the final balance.

   Beginning balance: $599.30         ATM deposit $250
   Check #99 Florida Power and light $197   Check #100 Cable $62.50
   Check #101 Lunch $26.50                ATM withdrawal $50

   a. $513.30       b. $515.30       c. $517.30       d. $519.30

Round the following numbers.

2. $83.99
   a. $83           b. $81           c. $79           d. $80

3. $68.44
   a. $60           b. $70           c. $69           d. $65

4. $101.71
   a. $101          b. $102          c. $100          d. $103

5. $19.99
   a. $20           b. $19           c. $18           d. $17
6. Using the following items and your own check register, record all checks and keep a quick balance. What is the quick balance?

   Beginning balance: $789.44       Deposit $100
   Check #100 Food $ 93.88       #101 Gas $39.00
   #102 Dentist $150.00       #103 Restaurant $77.30
   a. $520       b. $530       c. $540       d. $550

   Using $1,200 and 3%, calculate interest for:

   7. 4 months
      a. $10.00       b. $11.00       c. $12.00       d. $13.00

   8. 9 months
      a. $24.00       b. $25.00       c. $26.00       d. $27.00

   9. 10 days
      a. $0.99       b. $1.10       c. $1.01       d. $0.95

   10. 105 days
      a. $10.00       b. $10.36       c. $10.40       d. $10.50
# ANSWERS

1. 

<table>
<thead>
<tr>
<th># or code</th>
<th>Transaction Description</th>
<th>Amt.</th>
<th>Dep .</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exact</td>
<td>Quick</td>
<td></td>
</tr>
<tr>
<td>ATM</td>
<td>Dep</td>
<td>$250.00</td>
<td>$250</td>
<td></td>
</tr>
<tr>
<td>Check #99</td>
<td>F P L</td>
<td>$197.00</td>
<td>$200</td>
<td>$652.30</td>
</tr>
<tr>
<td>Check #100</td>
<td>Cable</td>
<td>$  62.50</td>
<td>$  60</td>
<td>$590</td>
</tr>
<tr>
<td>Check #101</td>
<td>Lunch</td>
<td>$  26.50</td>
<td>$  30</td>
<td>$560</td>
</tr>
<tr>
<td>ATM withdrawal</td>
<td></td>
<td>$ 50.00</td>
<td>$  50</td>
<td>$513.30</td>
</tr>
</tbody>
</table>

Actual balance $513.30.

2. $83.99 -------> $80  
   D

3. $68.44 -------> $70  
   B

4. $101.71 --------> $100  
   C

5. $19.99 --------> $20  
   A
6.  

<table>
<thead>
<tr>
<th># or code</th>
<th>Transaction description</th>
<th>Amt.</th>
<th>Dep.</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Exact</td>
<td>Quick</td>
<td></td>
</tr>
<tr>
<td>Exact</td>
<td>Quick</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$789.44</td>
<td>$790</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check#100</td>
<td>Food</td>
<td>$ 93.88</td>
<td>$ 90</td>
<td>$795.56</td>
</tr>
<tr>
<td>#101 Gas</td>
<td></td>
<td>$ 39.00</td>
<td>$ 40</td>
<td>$756.56</td>
</tr>
<tr>
<td>#102 Dentist</td>
<td></td>
<td>$150.00</td>
<td>$150</td>
<td>$606.56</td>
</tr>
<tr>
<td>#103 Restaurant</td>
<td></td>
<td>$ 77.30</td>
<td>$ 80</td>
<td>$529.26</td>
</tr>
</tbody>
</table>

Quick balance = $530

7.  $1200 x 3\% \times 4 \text{ month} = $12.00

8.  $1200 x 0.03 \times 9/12 = $27.00

9.  $1200 x 0.03 \times 10/365 = $0.9863 \text{ Round to} \rightarrow $0.99

10.  $1200 x 0.03 \times 105/365 = $10.356 \text{ Round to} \rightarrow $10.36
LESSON 7 THINGS TO REMEMBER

CHECK REGISTER/ACCOUNT BALANCES/ROUNDING

For the following transactions

Example: Balance $349.72
Check 101 Food $68.75
Check 102 Gas $45.53
Check 103 Phone $59.69
Check 104 Visa $103.34 Deposit $45.00

The check register for these transactions should look like the following:

<table>
<thead>
<tr>
<th># or code</th>
<th>Trans Desc.</th>
<th>Amt</th>
<th>Dep.</th>
<th>Bal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$349.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#101</td>
<td>Food</td>
<td>$68.75</td>
<td></td>
<td>$280.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$45.00</td>
<td></td>
<td>$325.97</td>
</tr>
<tr>
<td>#102</td>
<td>Gas</td>
<td>$45.53</td>
<td></td>
<td>$280.44</td>
</tr>
<tr>
<td>#103</td>
<td>Phone</td>
<td>$59.69</td>
<td></td>
<td>$220.75</td>
</tr>
<tr>
<td>#104</td>
<td>Visa</td>
<td>$103.34</td>
<td></td>
<td>$117.41</td>
</tr>
</tbody>
</table>

Register is up to date......As you can see:

$349.72 - $68.75 = $280.97 $280.97 + $45.00 = $325.97

Subtract checks <--------> Add Deposits

Rounding entries to check the balance. There are various ways to round numbers. The method in the textbook is round up to the tens place.

Example of rounding up/down to the tens place.

$89.95 is the exact amount. Rounding to the tens place gives $90.
You will look at the ones place to decide to round up or round down.
If your number is 85,86,87,88, or 89, you will round to 90
If your number is 81,82,83, or 84, you will round to 80

**Example:** Round the following number to the tens place:

72.48  92.98  63.98

Remember; look at the ones place to make your decision. The answers are:

70  90  60

**Example:**  Interest = Principal X Rate X Time

Calculate the amount of interest on $2400 at a 6% rate of interest.

Find the interest for one year; for 9 months; and for 240 days.

$2400 X .06 = $144 for one year

$2400 X .06 X 9 months/12 months = $144 X 9/12 = $144 X ¾ = $324

$2400 X .06 X 240 days/360 days = $144 X 2/3 = $96
LESSON 8: INVESTMENTS- Certificate of Deposit

A certificate of deposit is a type of savings account that requires a specific amount of your money for a specific period of time. This type of savings device generally pays a higher rate of interest, than a savings account.

- The difference between a savings account and a CD (certificate of deposit, not a “compact disc”) is the higher rate of interest and a penalty (loss of interest) for withdrawing money before the end of the specified period.

- CD’s earn interest that can be compounded daily, monthly, or quarterly. At this point, it must be noted that all the saving by any person can be wasted if a person uses credit cards with interest charges from 6% to as high as 28%.

If you save $500 at 3% but charge $500 at 18%, can you see you are spending more than the $500 charged? The interest charges greatly overcome the interest saved.

Save $500 \times 0.03 \times 1 \text{ year} = $15 interest saved in your savings account.

Spend $500 \times 0.18 \times 1 \text{ year} = $90 interest paid to someone else---$\$\$ Lost

If you want your money to work for you, you must stop paying interest to others.
In the previous example of $500 @ 3% for 1 year, you earned $15 simple interest.

- A CD offers 5% APR compounded daily. You invest your $500.

\[ 500 \times 1.051267 = 525.6335 \text{ ----> rounded, the interest is } 525.63. \]

\[ 525.63 - 500.00 = 25.63 \text{ interest..a lot more than the } 15.00. \]

But it is in your pocket and if you add the $90.00, you could save by not charging, $90 + $25.63 = $115.63

You now have a significant amount.

In the example CD $500, 5% daily compounding:

\[ 500 \times 1.051267 = 525.63 \]

**Where did I get this figure (1.051267)?**

Banks use computers and computer programs to calculate interest paid. I got the 1.051267 from a table. The calculation is much less complicated than the compound interest formula.

The table has been reproduced and it is on the following page.

**Can you find the 1.051267 in the table?**

Look at the top of the table.

It tells you $1.00 invested daily, monthly, and quarterly compounding.

Look at the left column and find 5%. Read across to column labeled “daily”.

Under the interest period 1 year, you should see 1.051267.
### Amount of $1.00 Invested—Daily, Monthly, and Quarterly Compounding

<table>
<thead>
<tr>
<th>Annual Rate</th>
<th>Daily Interest Period—1 Year</th>
<th>Monthly Interest Period—4 Years</th>
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<td>1.005012</td>
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</table>

Elements of Consumer Mathematics
Remember, the calculations are easy. Multiply the amount of money saved by the number located in the table.

**Stocks / Stock Dividends**

After *savings accounts and CDs*, *stocks* are capable of delivering the next higher return for the money you invest in them. Most financial experts will tell you that you can expect to see constant increase in stock prices but those increases will take place over many years. The stock market is a measure of the economy. As the economy grows, the market (value of stocks) grows. If the economy shrinks, the price of stocks will decrease in price.

So, what does this mean for you? It means that you must be in the market for many years to earn a higher return.

If you invest at 25 years of age and keep that money invested until age 65, that would be 40 years of investing. You could see as little as three times your original investment or as high as five times your original investment.

Before you invest any of your hard-earned money, you should learn as much as you can about investing. Some of the best written sources are “Investing for Dummies”, “Personal Finance for Dummies”, “Stock Investing for Dummies”. You can buy these or check them out first at your local library.
There are two ways to invest in the stock market.

First, buy an individual stock.

Second, buy a fund (group) of stocks through a mutual fund or an index fund.

When you buy individual stocks you must use a licensed stock broker. You will pay the broker a fee or commission. When you sell, the same will be true. Some investment books will tell you the way to make money in stocks is to “buy low and sell high”.

Example:
You buy Cisco at $17 a share and sell at $21. You have made money.

$21 (sales price ) - $17 (purchase price ) = $4 profit
If you bought 10 shares----> 10 x $4 = $40 profit
100 shares----> 100 x $4 = $400 profit
1000 shares----> 1000 x $4 = $4,000 profit

Another way...
10 shares x $17 each = $170 purchase amount
10 shares x $21 each = $210 sales amount
$210 sales price - $170 purchase price = $40 profit
Another example:

Example:
You have purchased 1000 shares of Cisco for $17 a share. It is one year later and the cost of each share of Cisco is $21. Without selling, you want to see how much you have made at this point and what is your percent of earning?

Purchase amount 1000 x $17 = $17,000
Worth one year later 1000 x $21 = $21,000
$21,000 - $17,000 = $4000 increase ---> $4000 / $17000 = .235 or 23.5 %

\[
\text{Amount of Increase / Original Cost} = \% \text{ of Increase}
\]

A 23.5 \% increase, as you can see, is possible and more than a savings account or CD. This is not Typical; possible but not typical.

You can make your money work harder by buying only stocks that pay a dividend. The stock pays a dividend as a way of sharing profits.

You buy a stock for $24.00. One year later it is still worth $24.00, but has paid a $1.00 dividend. You still have made money—$1.00, which you will get without selling your stock. If you take the dollar and divide by the value $24 you will get the annual yield of the stock.

\[
\frac{1.00}{24.00} = 0.0416\text{------> round to 0.042 & change to percent-----> 4.2 \%}
\]
Mutual funds and index funds allow you (through the funds) to share in the profits and losses of a wide range of stocks. Hopefully, because the fund has purchased a number of different stocks, more will be up than down and more pay dividends which are shared with you as a fund holder.

Bonds
Another investment tool is a “bond”. If you purchase a bond, you are acting like a bank for the issuer of the bond. Bonds are issued by corporations and governments. The bond guarantees repayment of the face value of the bond and payment of a stated interest rate.

If the face value of the bond is $1,000 and pays 6% Annual Percent Rate (APR), you will receive 6% of $1,000 ($60) each year until the bond “matures”. At that future date you also will receive the bond’s “face value” (in this case, $1,000). The reason is these bonds mature in 10 to 30 years. This means you will wait 10 to 30 years to get the $1,000 face value. This is another incentive to buy bonds, paying less than the bond’s face value (the bond’s “cost”) in order to receive the face value many years later.
Example: $1,000 bond costs 90% but pays 5% APR

First: Calculate interest payment earned

\[
1,000 \times 5\% = ?
\]

\[
1,000 \times 0.05 = $50.00 \text{ interest paid to you annually}
\]

Second: Calculate the cost of the bond

\[
1,000 \times 90\% = ?
\]

\[
1,000 \times 0.90 = $900 \text{ cost at time of purchase}
\]

Third: Annual Yield = Interest / Bond Cost

\[
= \frac{50}{900} = 0.05555 \rightarrow 5.6\%
\]

Round to 0.056 —> write as a percent 5.6%

Key Terms

Certificate of deposit          Stocks
Stock dividends                 Bonds

PROBLEMS

1. Calculate interest on $2,000 for 1 year compounding daily at 2.25 % APR
   a. $45.00        b. $45.51        c. $46.00        d. $46.51

2. Calculate interest on $4,000 for 1 year compounding daily at 4.50% APR
   a. $184.10       b. $185.00       c. $186.10       d. $187.00
3. Calculate interest on $4,000 for 4 years compounding daily at 9% APR
   a. $1700.00  b. $1730.00  c. $1733.06  d. $1750.00

4. You buy a stock for $5.25. One year later it is worth $5.95. If you sell now, what is your profit? If you had 100 shares? If you had 1000 shares?
   a. $40 $400  b. $50 $500  c. $60 $600  d. $70 $700

5. You purchase 475 shares of a stock for $11.00 a share. One year later it is worth $18.00 a share. Find the profit if you sold.
   a. $3,325.00  b. $3125.00  c. $3225.00  d. $3,000.00

6. You purchase 10,000 shares of a stock for $0.85. One year later it is worth $0.95 a share. Find the percent of increase.
   a. 11%  b. 12%  c. 11.76 %  d. 11.5 %

7. Purchase price $51.59 per share. Dividend is $1.02 per share. What is the annual yield?
   a. 1.9 %  b. 1.98 %  c. 2.0 %  d. 1.0 %

8. Purchase price $14.75 per share. Dividend is $0.85 per share. What is the annual yield?
   a. 5.0%  b. 5.35 %  c. 5.70 %  d. 5.76 %
Calculate interest and cost of bond; for a $1000 bond at 81.5 \% paying 6\%

9. Calculate interest
   a. $60.00  
   b. $50.00  
   c. $70.00  
   d. $40.00  

    a. $715.00  
    b. $815.00  
    c. $915.00  
    d. $615.0

**ANSWERS**

1. Certificates of deposit  
   $2,000  \times  1.022754  =  \text{rounds to}  \rightarrow  $2,045.51
   
   $2,045.51 - $2,000.00 = $45.51  
   
   **B**

2. Certificates of deposit  
   $4,000  \times  1.046025 = $4,184.10
   
   $4,184.10 - $4,000.00 = $184.10  
   
   **A**

3. Certificates of deposit  
   $4,000 \times 1.433266 = \text{rounds to} $5,733.06
   
   $5,733.03 - $4,000.00 = $1,733.06  
   
   **C**

4. Stocks and Stock Dividends  
   $5.95 - $5.25 = $0.70 \text{ increase}
   
   $0.70 \times 100 = $70 \text{ Profit}
   
   $0.70 \times 1000 = $700 \text{ Profit}  
   
   **D**

5. Stocks  
   $18.00 - $11.00 = $7.00
   
   $7.00 \times 475 \text{ shares} = $3,325.00 \text{ Profit}  
   
   **A**
6. Stocks $0.95 - $0.85 = $0.10 increase
   
   Amount of increase / original cost = % of increase
   
   $0.10 / $0.85 = 0.1176 Change to a per cent 11.76 %
   
7. Dividend yield $1.02/$51.59 = 0.01977 —> 1.98 %
   
8. Dividend yield $0.85/$14.75 = 0.0576271 ——> 5.76 %
   
9. Interest $1.000 x 0.06 = $60.00
   
10. cost of the bond $1,000 x 81.5 % = ?
    
    $1,000 x 0.815 = $815.00
Fortunately, there are computers and already established tables to assist in the calculation of interest. One such table introduced in the textbook (the Monthly Interest Table) tells you $1.00 invested daily, monthly, and quarterly compounding. For 5% use $1.221386 for each $1.00 invested.

The amount of the investment is $4000. Calculate the amount of interest. Multiply the amount of the investment, $4000 \times 1.221386 = $4,885.54.

**Example for stock purchase/sale**

You buy Cisco at $17 a share and sell at $21. You have made money.

\[
\text{Profit} = \text{Sales Price} - \text{Purchase Price} = 21 - 17 = 4
\]

- If you bought 10 shares—-> 10 \times 4 = $40 profit
- 100 shares-----> 100 \times 4 = $400 profit
- 1000 shares----> 1000 \times 4 = $4,000 profit

**Another way...**

\[
\begin{align*}
10 \text{ shares} \times 17 \text{ each} &= $170 \text{ purchase amount} \\
10 \text{ shares} \times 21 \text{ each} &= $210 \text{ sales amount} \\
$210 \text{ sales price} - $170 \text{ purchase price} &= $ 40 \text{ profit}
\end{align*}
\]

**Example percent of increase on sale of stock (decrease)**

You have purchased 1000 shares of Cisco for $17 a share. It is one year later and the cost of each share of Cisco is $21.
Without selling, you want to see how much you have made at this point and what is your percent of earning?

- Purchase amount: 1000 x $17 = $17,000
- Worth one year later: 1000 x $21 = $21,000
- $21,000 - $17,000 = $4000 increase

\[
\frac{\$4000}{\$17000} = .235 \text{ or } 23.5\%
\]

**Amount of Increase / Original Cost = % of Increase**

A 23.5% increase, as you can see, is possible and more than a savings account or CD. This is **not** typical; **possible** but **not typical**

**Dividends and yield:** You can make your money work harder by buying only stocks that pay a dividend. The stock pays a dividend as a way of sharing profits.

You buy a stock for $24.00. One year later it is still worth $24.00, but has paid a $1.00 dividend. You still have made money—$1.00, which you will get without selling your stock. If you take the dollar and divide by the value $24 you will get the annual yield of the stock.

\[
\frac{\$1.00}{\$24.00} = 0.0416\\\text{round to } 0.042 \text{ & change to percent} = 4.2\%
\]

**Example bonds:** $1,000 bond costs 90% but pays 5% APR

**First:** Calculate interest payment earned

\[
\$1,000 \times 5\% = \?\\\$1,000 \times 0.05 = \$50.00 \text{ interest paid to you annually}
\]
Second: Calculate the cost of the bond

\[ \$1,000 \times 0.90 = \$900 \text{ cost at time of purchase} \]

Third: Annual Yield = Interest / Bond Cost

\[ \frac{\$50}{\$900} = 0.05555 \rightarrow 5.6\% \]

Round to 0.056 —> write as a percent 5.6\%
LESSON 9: INSURANCE

Health insurance

Health insurance coverage is protection against accidents or illnesses that could create large medical expenses. You have to look at health care insurance as almost mandatory — like car insurance.

There are many kinds of health insurance with many different providers. The most common health insurance plans are the Traditional,” P.P.O. “, and HMO. A “ traditional” plan has a list of amounts it will pay for medical services. Under the plan, you go to any doctor.

PPO is preferred provider organization. You can use only doctors that are listed by the PPO. An HMO, health maintenance organization, sends you to a general practitioner (primary care physician) who then has to authorize your visits to specialists.

If you do not work for an employer who provides health insurance, you will have to pay what the organization charges. You will have to budget for this. Take the yearly cost and divide by 12 to get the monthly amount to budget.

Your employer may pay part or all of the health insurance premiums. If it pays part, you will pay the rest. Employees may pay anywhere from 50% to 100%. 
Remember 100% becomes 1.00 when changed from a percent.

50% ----> 0.50
75% ----> 0.75
80% ----> 0.80
100% —> 1.00

If the employer is paying 100%, then it is paying **all** of the premiums.

**Example**

Your employer is using a program that charges $7,200 for each employee’s medical insurance. Your employer will pay 75% of the cost.

This means you will: pay 25%.

\[
100\% - 75\% = 25\%
\]

Your cost is $7,200 \times 25\% = $1,800

What would your monthly budget amount be? What would your bi-weekly be?

$1,800 / 12 = $150 monthly

$1800 / 26 = $69.23 every two weeks

**Term Life Insurance**

According to some people there are only two types of insurance. These are term life and all the others.
We will discuss only term life. The reason for this is that it is the most cost effective. You can get the largest amount of coverage for the smallest amount of money. There is no savings amount in term life. You can’t borrow against it, and you can’t turn it in for cash value. The only way you collect money is WHEN you die (and all of us will, sooner or later). It is very much like car insurance; you collect ONLY if you are involved in an accident.

If you are single, term life insurance could be used to pay off a debt and provide money for burial when you die. If you are married, both the husband and wife should carry term life insurance so that the surviving spouse can pay funeral and living expenses.

Let’s say a wife earns $30,000 a year. Upon her untimely death, her husband would not only have lost his spouse, but $30,000 in yearly income. If the wife had $300,000 in term life, the husband would have $300,000/$30,000 = 10 years of income after his wife’s death. Obviously the same would be true if a husband died.

You would purchase term life for a specified period of time. You would buy coverage for whatever amount you would consider adequate for your needs. Term life is sold by units of $1,000. The cost per unit of $1,000 varies by age and gender. The younger you are, the less expensive the coverage will be. The cost is also less expensive for women than it is for men. On the following page you will find a table showing the cost per $1,000.00 of term life insurance.
## Annual Premium per $1,000 of life insurance: 5 Year Term

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<td>60</td>
<td>$13.22</td>
<td>$9.71</td>
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### What would $300,000 of coverage cost the wife mentioned in the previous paragraphs?

If the wife was 18-30 the cost would be $2.13 per $1,000

**First:** 300,000/1000 = 300 units of term life insurance

**Second:** 300 units × $2.13 each = $639.00 Yearly premium

**Third:** $639 / 12 months = $53.25 monthly payment

As mentioned previously, as you age your cost for term life will increase. In addition to calculating the annual premium, you can calculate the increase and the percent of increase.
Example:
$100,000— 5 year term—age 35. Then, $100,000— 5year term age 40.
Female
1<sup>st</sup>: Age 35 premium from table -------> $2.29
$100,000 / 1,000  x  $2.29  =  $229 annual premium
2<sup>nd</sup>: Age 40 premium from table ------->$2.67
$100,000 / $1,000  x  $2.67  =  $267 annual premium
3<sup>rd</sup>: Subtract to find increase
$267  -  $229  =  $38 increase in annual premium
4<sup>th</sup>: % increase
Increase / Original amount (age 35)  =  $38 / $229  =  .1659388
5<sup>th</sup>: Round to .1659
6<sup>th</sup>: Change to a percent -----> 16.59 %
PROBLEMS

A Health Insurance Plan costs $4,775 each year for each employee.

The Employer pays 50% of this premium.

1. What do you pay?
   a. $2,300.00  b. $2,387.50  c. $2,400.00  d. $2,087.00

2. What do you budget monthly?
   a. $198.96  b. $198.00  c. $197.96  d. $198.00

A different Health Insurance Plan costs $10,098 each year for each employee.

The Employer pays 80% of this premium.

3. What do you pay?
   a. $2,000.00  b. $2,010.00  c. $2019.60  d. $2,020.19

4. What do you budget monthly?
   a. $165.30  b. $166.30  c. $167.30  d. $168.30

5. Plan costs $2,885.00. Employer pays 90%. What do you pay?
   a. $288.50  b. $287.50  c. $286.50  d. $285.
You are a 35 year old male. You want $500,000 in term life insurance.

6. What is the yearly cost of this term life insurance?
   a. $1359.32           b. $1350.00           c. $1365.00           d. $1342.32

7. What is the monthly cost of this term life insurance?
   a. $110.50             b. $111.50             c. $112.50             d. $113.50

Your wife is a 36 year old female. You want $500,000 in term life insurance

8. Calculate the yearly cost.
   a. $1142.00          b. $1143.00            c. $1144.00           d. $1145.00

9. Calculate the monthly cost.
   a. $95.00              b. $95.42                c. $94.00               d. $94.52

10. $75,000 policy age 35 and age 40 (male)
    Calculate percent of increase.
    a. 21.11 %            b. 20.11 %                 c. 19.11%           d. 18.11

ANSWERS
1. 100% - 50% = 50% your cost
    $4,775 \times 50\% = $2,387.50 ----> yearly  B

2. $2387.50 / 12 = $198.9583 ----> $198.96 monthly  A
3. 100% - 80% = 20%  $10,098 \times 20\% = $2019.60  

4. $2019.6 / 12 = $168.30  

5. 100% - 90% = 10%  $2,885 \times 10\% = $288.50  

6. 500,000 / 1,000 = 500 units  
   500 units \times $2.70 (from table) = $1,350.00  

7. $1,350 / 12 = $112.50 monthly  

8. 500,000 / 1,000 = 500 units of this term life insurance  
   500 \times $2.29 (from table) = $1,145.00  

9. $1,145.00 / 12 = $95.4166 -----> $95.42  

10. $75,000 / 1,000 = 75 units  
   $3.27 \times 75 units = $245.25 \hspace{2cm} \text{Age 40}  
   $2.70 \times 75 units = $202.50 \hspace{2cm} \text{Age 35}  
   $245.25 - $202.50 = $42.75  
   $42.75 / $202.50 = 0.211111 -----> 21.11\%
Example Cost Calculations for Health Plans

Your employer is using a program that charges $7,200 for each employee’s medical insurance. Your employer will pay 75% of the cost. This means you will: pay 25%.

\[
100\% - 75\% = 25\%
\]

Your cost is \(7,200 \times 25\% = 1,800\)

What would your monthly budget amount be?

What would your bi-weekly be?

\[
\frac{1,800}{12} = $150 \text{ monthly} \quad \frac{1800}{26} = $69.23 \text{ every two weeks.}
\]

Premiums for life insurance usually can be found in tables and are based upon some unit of insurance, usually $1000, for certain ranges of age, and for gender.

If the cost per unit insurance ($1000) from the table for an age 25 male is $2.47, calculate the cost of a $100,000 policy. The calculation is $2.47 (per $1000) times 100 equals $247 annual premium for $100,000 of the life insurance. (Why multiply by 100? Add $1000 100 times and you get 100,000.)
Example to calculate % of increase in annual cost.

$100,000 5 year term—age 35. Then, $100,000— 5 year term age 40. Female

1\textsuperscript{st}: Age 35 premium from table -------> $2.29
   \[ \frac{100,000}{1,000} \times 2.29 = 229 \text{ annual premium} \]

2\textsuperscript{nd}: Age 40 premium from table -------> $2.67
   \[ \frac{100,000}{1,000} \times 2.67 = 267 \text{ annual premium} \]

3\textsuperscript{rd}: Subtract to find increase
   \[ 267 - 229 = 38 \text{ increase in annual premium} \]

4\textsuperscript{th}: % increase
   \[ \frac{\text{Increase}}{\text{Original amount (age 35)}} = \frac{38}{229} = 0.1659388 \]

5\textsuperscript{th}: Round to 0.1659

6\textsuperscript{th}: Change to a percent -------> 16.59 %
LESSON 10: HOUSING

Rental & Ownership

Rental
In a household budget, one of the fixed monthly expenses certainly is the cost for housing. That cost can occur either through renting or ownership. How much should you spend on rental housing?

Books on household budget suggest you spend anywhere from 20 to 25% of your gross income on housing.

Example:
You earn $35,000 yearly. What is the range of money you should spend on housing?

$35,000 \times 20\% \rightarrow 35,000 \times 0.20 = 7,000

$7,000 yearly \rightarrow 7,000 \div 12 \text{ months} = 583.3333 \text{ monthly}

Round $583.3333 down to $583.00

$35,000 \times 25\% \rightarrow 35,000 \times 0.25 = 8,750

$8,750 yearly \rightarrow 8,750 \div 12 \text{ months} = 729.1666 \text{ monthly}

Round $729.1666 down to $729 monthly

So the RANGE of the monthly payments is $583.00 -- $729.00 (20 – 25 %)
1st You are paying $1200 a month for rent and you earn $35,000 a year.

What percent of your income are you spending for rent?

$1200 (monthly) \times 12 \text{ months} = $14,400 \text{ yearly rent}

What percent of your income is spent on rent?

We will now use the proportions method to calculate the percentage. A proportion is two equal fractions. $1/2 = 4/8$ This is a proportion.

When you do percentage problems, the left fraction is always the percent ($\%$)

$$\frac{X}{100} = \frac{X}{X}$$

The right fraction will be made by doing the following:

What percent ($\%$) of your income is spent on rent

Left Fraction Right fraction

$$\frac{X}{100} = \frac{\text{Rent}}{\text{Income}}$$

In our problem, “what percent” will be written as $x \div 100$

$$\frac{x}{100} = \frac{\text{Rent}}{\text{Income}} = \frac{\$14,400}{\$35,000}$$

**Cross-multiply:**

Multiply 100 by $14,400$ Multiply $X$ by $35,000$

Now you will have $35,000 \times X = 100 \times 14,400 = $1,440,000
Divide both sides by $35,000

\[
\frac{\$35,000 \times X}{\$35,000} = \frac{\$1,440,000}{\$35,000}
\]

You now have: \(X = 41.142857\), Which rounds to \(\rightarrow 41\%\)

The right fraction always looks like this:

\[
\text{IS} \rightarrow \text{Whatever follows is OF} \rightarrow \text{Whatever follows of}
\]

The left fraction always will be written as something over 100.

\[
50\% \rightarrow \frac{50}{100} \quad \text{Unknown} \% \rightarrow \frac{x}{100}
\]

\[
\frac{\%}{100} = \text{Is} \quad \text{Proportion method} \quad \text{Of}
\]

There are only three possible percentage problems:

Consider \(\rightarrow 50\% \) of 400 is 200. There is nothing missing.

**1st problem**: 50% of what is 200?

\[
\frac{50}{100} = \text{is} \quad \frac{200}{X} \quad \text{Of} \quad \text{cross-multiply}
\]

\[
\frac{50 \times X}{50} = \frac{2,000}{50} \quad \rightarrow \quad X = 400
\]

**2nd problem**: 50 % of 400 is what ?

\[
\frac{50}{100} = \text{is} \quad \frac{\text{what}}{400} \quad \text{Of} \quad \text{cross-multiply}
\]

\[
\frac{100 \times X}{100} = \frac{20,000}{400} \quad \rightarrow \quad X = 200
\]
3rd problem: What % of 400 is 200?

\[
\frac{X}{100} = \frac{\text{is 200}}{\text{of 400}} \quad \text{----> cross-multiply}
\]

\[
\begin{align*}
400 \times X &= 100 \times 200 = 20,000 \\
\frac{400 \times X}{400} &= \frac{20,000}{400} \quad \text{----> } X = 50% 
\end{align*}
\]

Ownership

When it comes to owning a home, you have two choices. One option is to save the entire amount of the purchase price (pay cash). The second option is to save a percentage of the purchase price for a “down payment” and get a mortgage (a loan) for the rest. Most people will save a percentage of the purchase price and then apply for a mortgage.

Before deciding how much house/home you can buy, you should understand how much money you can get from a mortgage. It used to be that lending institutions would lend only 250% to 300% of the borrowers' combined incomes.

Question:

“What does this mean, as far as the borrowers are concerned?”

Also, you should notice that this is the first time we have mentioned per cents over 100%.

If we use the proportions method introduced in the previous section, everything should become clear.
1st  Simplify the math

\[
\frac{300}{100} \quad \longrightarrow \quad 3 \quad 300\% \text{ divided by } 100\% \text{ gives you the whole number } 3
\]

2nd  \[\frac{3}{1} = \text{Amount of loan} \quad $40,000\]

3rd  Cross-multiply  Multiply 3 x $40,000 and you get $120,000

4th  1 times the amount = Amount of loan = $120,000

Let us do another example using 250 %

A mortgage (loan) of 250 % of your income is what amount?

\[
\frac{250}{100} = \frac{\text{amount of the loan}}{\$40,000 \text{ income}}
\]

1st  Simplify  \[\frac{250}{100} \quad \text{Using a calculator, divide 250 by 100} \quad \rightarrow 2.5\]

2nd  \[\frac{2.5}{1} = \frac{\text{amount of loan}}{\$40,000 \text{ income}}\]

3rd  Cross-multiply  1 times the amount = 2.5 times $40,000 income

Multiply 2.5 times $40,000 using a calculator and you will get $100,000
You can now see the range of the loan amount 250 % to 350 % —$100,000
up to $120,000 You should now see that 300 % is 3 times your income and
250% is 2.5 or 2 \frac{1}{2} times your income.
Example / Problem:
A lending institution has informed you that it will lend to you 300 % of your income. Your income is $40,000. What amount will they lend you?
The problem becomes: “300 % of your income is what amount?”

\[
\begin{align*}
300 &= \text{what amount (X)} \\
100 &= \text{of your income ($40,000)} \\
300 &= \text{Amount of loan} \\
100 &= \text{$40,000}
\end{align*}
\]

Any percent that is less than 100 % is a fraction and therefore a decimal.

**Example:** 50 % —> 50 / 100 ——> 1 / 2 ——> 0.50

Any percent that is more than 100 % is a whole number or a mixed number ( a whole number and a fraction )

Example: 250 % —> 250 / 100 ——> 2 1/2 ——> 2.5

200 % ——> 200 / 100 ——> 2 ——> 2.00

Lending institutions typically will loan only a part of the purchase price. This requires the borrower to have what is called a down payment. The down payment can be as little as 5 % of the purchase price and can go as high as 30 % or more.

Simply stated: **Loan amount = Sales price - down payment**
The down payment has to be money that the borrower has saved or a ‘gift’. The down payment cannot be borrowed money.
What does this mean for you as a borrower?

**Example:** cost of home: $300,000  
Down payment: 5%

The down payment is 5% of $300,000

\[
\frac{5}{100} = \frac{X \text{ (down payment)}}{\text{of } 300,000} \quad \text{cross-multiply}
\]

\[
100 \times X = 5 \times 300,000
\]

\[
100 \times X = 1,500,000
\]

\[
\frac{100 \times X}{100} = \frac{1,500,000}{100}
\]

Down payment ($X) —> $15,000

Another way to do the same problem:

5% of $300,000 —> Change 5% to 0.05 —> 0.05 times 300,000 = $15,000

If the down payment was 30% of the purchase price:

\[
30 \% / 100 \% = \frac{\text{(Is) down payment}}{\text{$300,000}}
\]

\[
30 \times 300,000 \rightarrow 9,000,000
\]

Divide $9,000,000 by 100 ----> $90,000 Down payment

The range of 5% to 30% produces a down payment range of

$15,000 to $90,000

Now, let us look at the mathematics you can do before you look for a house or condominium.

1st: Assume the lending institution will allow you to borrow 300% of your income as the purchase price of a home. If you are single, then it would be based upon 300% of your income.
If you are married, and your spouse is working, then 300% of your total incomes will be used.

Example: Total income ---> $90,000 --> 300% of $90,000 is?

\[
\frac{300}{100} = \text{Purchase Price} / \text{of} \ 90,000
\]

3 times 90,000 = Purchase Price --> $270,000

2nd If you are a first time home buyer, assume that the bank requires a 5% down payment

\[
\frac{5}{100} = \text{down payment} / \$270,000
\]

Cross-multiply, then divide by 100

5 times $270,000, divide by 100
$1,350,000 divided by 100 ----> $13,500 down payment

3rd So if you wish to purchase a $270,000 house, you must have $13,500 or more for a down payment.

Finally, if you purchase a house or condominium, what will your monthly payment cost you?

That will depend on how much money you borrow and the interest rate the lending institution charges you.

Lending institutions and real estate people typically have loan cost calculators. These calculators typically have a table of information stored in them.
A typical table is below

Monthly Payment for a $1,000 Loan

<table>
<thead>
<tr>
<th>Annual Interest Rate</th>
<th>Length of Loan in Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>5.00 %</td>
<td>$6.60</td>
</tr>
<tr>
<td>5.50 %</td>
<td>$6.88</td>
</tr>
<tr>
<td>6.00 %</td>
<td>$7.16</td>
</tr>
<tr>
<td>6.50 %</td>
<td>$7.4</td>
</tr>
<tr>
<td>7.00 %</td>
<td>$7.75</td>
</tr>
<tr>
<td>7.50 %</td>
<td>$8.06</td>
</tr>
<tr>
<td>8.00 %</td>
<td>$8.36</td>
</tr>
</tbody>
</table>

You will use the table to solve the following problem:

**PROBLEM:**

You are applying for a $90,000 mortgage at an annual percentage rate of 5 %. You want the lowest monthly payment and the lender told you to borrow for a period of 30 years. Using the table, look at 5 % and read across to the figure $5.37 under 30 years.

$$1^{st} \text{ Mortgage amount} \div \$1,000 \times \text{Figure from table} = \text{Monthly payment}$$

$$\frac{90,000}{1,000} \times 5.37 \rightarrow 90 \times 5.37 = 483.30 \text{ monthly payment}$$

The $5.37 is for a one thousand dollar loan. When you divide $90,000 by $1,000 you have 90 (one thousand dollar loans). So, the 90 times $5.37 gives you the monthly payment for a $90,000 loan.
What is the amount you will pay in 30 years?

Monthly payment \times \text{number of years} \times 12 \text{ months/year} \quad \text{total paid out}

\$483.30 \times 30 \text{ years} \times 12 \text{ months} = \text{total paid out}

\$483.30 \times 360 \text{ (payments)} = \$173,988.00 \text{ total paid out}

How much interest did you pay?

Total amount paid - mortgage amount = \text{interest}

\$173,988.00 - \$90,000.00 = \$83,988.00 \text{ interest paid}

### Key terms

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Home ownership</th>
<th>Down payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan amount</td>
<td>Loan calculator</td>
<td></td>
</tr>
</tbody>
</table>

### PROBLEMS

1. You make $28,000.00. Using the 20% - 25% range, calculate the low end and the high end of the amount you should spend on housing.
   
   a. $5,600 low  
   b. $6,600 low  
   c. $7,600 low  
   d. $8,600 low
   
   $7,000 high  
   $8,600 high  
   $9,600 high  
   $9,600 high

2. You are paying $975.00 a month for rent and you earn $32,500.00 a year.
   What percent of your income are you spending for rent?
   
   a. 35%  
   b. 36%  
   c. 37%  
   d. 38%
3. You make $45,000.00. The bank will loan 250% to 300% of your income. What is the least and most the bank will loan.
   a. $110,500 least  b. $111,500 least  c. $112,500 least  d. $113,500 least
   $125,000 most  $130,000 most  $135,000 most  $140,000 most

**Change the following percentages to fractions and then to decimals.**

4. 325%
   a. $9 / 4 → 2.25  b. $11 / 4 → 2.75  c. $12 / 4 → 3.00  d. $13 / 4 → 3.25

5. 275%
   a. $9 / 4 → 2.25  b. $11 / 4 → 2.75  c. $12 / 4 → 3.00  d. $13 / 4 → 3.25

6. Cost of home is $150,000.00. If a lending institution requires 10% down payment, how much is the down payment?
   a. $15,000  b. $16,000  c. $17,000  d. $18,000

7. A condo costs $1,000,000.00. You must put down 20%. What is the down payment?
   a. $200,000  b. $300,000  c. $400,000  d. $500,000

You are applying for a $225,000.00 mortgage at an annual percentage rate of 6% for 20 years.

8. What is the monthly payment?
   a. $1,311.00  b. $1,411.00  c. $1,511.00  d. $1,611.00
9. What is the total amount paid?
   a. $386,640.00  b. $385,640.00  c. $384,640.00  d. $383,640.00

10. What is the total amount of interest paid.
    a. $160,640.00  b. $161,640.00  c. $162,640.00  d. $163,640.00

**ANSWERS**

1. $28,000.00 x 20 % —> $28,000 x 0.20 = $5,600.00

   Answer: A

2. \[
   \frac{X}{100} = \frac{Rent}{Income} \quad x = \frac{975/\text{month} \times 12 \text{ months}}{32,500} = \$11,700.00 \text{ rent}
   \]

   \[
   \frac{X}{100} = \frac{\text{Annual Rent} \$11,700}{\text{Annual income} \$32,500} \quad \text{Cross-multiply}
   \]

   \[
   \frac{32,500}{100} \times X = 1,170,000
   \]

   \[
   32,500 \times X = 32,500 \times 36% = 36
   \]

   Answer: B

3. $45,000 x 250 % —> $45,000 x 2.5 = $112,500.00 least

   $45,000 x 300 % —> $45,000 x 3.0 = $135,000.00 most

   Answer: C

4. \[
   \frac{325 \%}{100\%} = \frac{325}{100} = 3.25 \quad \text{Fraction}
   \]

   Answer: D
5. \[ \frac{275\%}{100\%} = \frac{275}{100} = \frac{5 \times 55}{5 \times 20} = \frac{5 \times 11}{5 \times 4} = \frac{11}{4} = 2.75 \text{ decimal} \]

6. \[\$150,000 \times 10\% = \$15,000\]
\[\$150,000 \times 0.10 = \$15,000.00\]

7. \[\$1,000,000 \times 20\% = \$200,000.00\]

8. \[\frac{\$225,000}{\$1,000} \times 7.16 \text{ (from table)} = 225 \times 7.16 = \$1,611.00 \text{ monthly payment}\]

9. \[\$1,611 \times 20 \text{ years} \times 12 \text{ months} = \$386,640.00 \text{ total amt. Paid}\]

10. Total paid - mortgage amount = interest
\[\$386,640 - \$225,000 = \$161,640.00\]
LESSON 10 THINGS TO REMEMBER

Example to calculate least and greatest amount to spend on housing.

*Note: if two people are earning money then combine the two salaries.*

You earn $35,000 yearly. What is the range of money you should spend on housing?

\[
\begin{align*}
35,000 \times 20\% & \rightarrow 35,000 \times 0.20 = 7,000 \\
7,000 \text{ yearly} & \rightarrow 7,000 / 12 \text{ months} = 583.3333 \text{ monthly}
\end{align*}
\]

Round $583.3333 down to $583.00

\[
\begin{align*}
35,000 \times 25\% & \rightarrow 35,000 \times 0.25 = 8,750 \\
8,750 \text{ yearly} & \rightarrow 8750 / 12 \text{ months} = 729.1666 \text{ monthly}
\end{align*}
\]

Round $729.1666 down to $729 monthly

So, the RANGE of the monthly payments is:

\[
583.00 ---- 729.00 \ (20\% \ – \ 25\%)
\]

**Example: Percentage of rent to income.**

You are paying $1200 a month for rent and you earn $35,000 a year. What percent of your income are you spending for rent?

\[
1200 \ (\text{monthly}) \times 12 \text{ months} = 14,400 \text{ yearly rent}
\]
What percent of your income is spent on rent? $14,400/$35,000

In our problem, “what percent” will be written as $ x / 100$

\[ \frac{x}{100} = \frac{\text{Rent}}{\text{Income}} = \frac{14,400}{35,000} \]

Cross-multiply:

Multiply 100 by $14,400$

Multiply $x$ by $35,000$

Now you will have $35,000x = 100 \times 14,400 = 1,440,000$

Divide both sides by $35,000$

\[ \frac{35,000x}{35,000} = \frac{1,440,000}{35,000} \]

$\frac{x}{35,000} = \frac{41.142857}{35,000}$

You now have: $x = 41.142857$, which rounds to $41\%$

**PURCHASING A HOME**

You could purchase a home at 250% to 300% of your income. If you earn $50,000 what is the least and most you could spend on a home:

The least amount, $L$, is 250% of $50,000 and the most, $M$, is 300% of $50,000.

(250% is 2.50 and 300% is 3.00.) $2.50 \times 50,000 = L = 125,000$ and $3.00 \times 50,000 = 150,000$.

**Down payment**

Assume that you are purchasing a home for $150,000. The bank requires a 20% down payment.
What is the amount of the down payment?
20% is .20 and \( .20 \times \$150,000 = \$30,000 \).

What would the mortgage amount be for the above?
**Loan amount = Sales price - down payment.**
Loan amount = $150,000 - $30,000 = $120,000.

Your $120,000 mortgage has been approved at 6.5% for 30 years.
If you were to use a Monthly Payment Table, you see that a 6.5% mortgage for thirty years will cost $6.32 per $1,000.

What will your monthly mortgage payment be?

Multiply $6.32 \times 120 = $758.40.
(Note that you will also probably be adding a monthly payment for taxes and insurance.)

What will be the total amount paid and the total amount of interest?

**Monthly payment \times number of years \times 12 months/ year = Total paid**

\[ \$758.40 \times 30 \text{ years} \times 12 \text{ months/year} = \$758.40 \times 360 \text{ months} = \$273,024. \]

**Total amount paid - mortgage amount = interest**

\[ \$273,024 - \$120,000 = \$153,024. \]
Lesson 11: Automobile Ownership and Leasing

Purchase / Ownership

When purchasing a new vehicle, you will find a sticker on the vehicle’s window. This sticker, by law, will list the **base price** and standard equipment. It will also list the optional equipment the vehicle has and the cost of these **options**. The sticker will also have **destination charge**.

The **total** price or **sticker price** is the total of the base price, the price of all of the options and the destination charge.

**Example:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four door sedan with a base price of</td>
<td>$10,998.00</td>
</tr>
<tr>
<td>Options:</td>
<td>$375, $900, $1025</td>
</tr>
<tr>
<td>Destination charge:</td>
<td>$399</td>
</tr>
<tr>
<td>Base Price</td>
<td>$10,998.00</td>
</tr>
<tr>
<td>Options</td>
<td>375.00</td>
</tr>
<tr>
<td></td>
<td>900.00</td>
</tr>
<tr>
<td></td>
<td>1,025.00</td>
</tr>
<tr>
<td>Destination Charge</td>
<td>399.00</td>
</tr>
<tr>
<td>Sticker Price</td>
<td>$13,697.00</td>
</tr>
</tbody>
</table>

You should always check to make sure the total price printed on the sticker matches your addition and total.

You should never pay the sticker price. Dealers are entitled to a profit but not an overly large one! Remember, the **manufacturer** has printed the sticker prices.
Elements of Consumer Mathematics

These prices, as stated on the sticker, are a suggested or starting point to negotiate a final price. This sticker price sometimes is called the “Manufacturer’s Suggested Retail Price” or MSRP. The dealer does not pay the MSRP and neither should you. You can research the dealer’s cost by going on the internet or by reading consumer magazines. The internet or consumer magazines will list the dealer’s cost as a percent of the MSRP. You should negotiate a price less than the sticker price and higher than the dealer’s cost.

Example:
You want to purchase a new car. The sticker shows a base price of $12,999.00 and options totaling $2,999.00 The destination charge is $375. Your research shows the dealer’s cost is 95% of the base price and 85% of the options cost. What should you estimate the dealer’s cost to be?
95% of $12,999 = $12,349.05
85% of $2,999 = 2,549.15
Destination charge = 375.00
Total cost for dealer $15,273.20 Total sticker price = $16,373.00
$16,373 - $15,273 = $1,100 difference between sticker price and dealer’s cost.
Leasing a Vehicle

One alternative to purchasing a vehicle is leasing. When you lease a vehicle you make monthly payments to a dealer, leasing company, or bank. At the end of the lease term, the car is returned to the leasing identity. If you have not exceeded the mileage listed in the contract and not caused any damage to the car, then you will not owe any more money. Some leases will offer to sell the vehicle to you, at the end of the lease, for a price called the residual value. Most, but not all, leases require a deposit plus a monthly payment for 24 months, 36 months, 48 months, or 60 months.

Example:

You are offered a lease at $199.00 a month for 36 months. Your deposit is $1500.00 plus a title fee of $105.00 and a license fee of $85.00. What is your total cost?

$199 \times 36 = 7,164$
Deposit = $1,500
Title fee = $105
License fee = $85

Total lease cost = $8,854

Renting a Vehicle

If you own a vehicle and it is damaged or inoperable due to a mechanical failure, you may need to rent a vehicle until yours is repaired. If you need a specialized vehicle, such as a truck or a van, for a few days, you should rent one.
Elements of Consumer Mathematics

Some rental agencies charge a daily rate plus a per mile rate. Others charge a daily rate only. The renter pays for all gasoline and must return the vehicle with a full tank of gas or pay a gasoline charge. You will probably also have to pay for a collision damage waiver (C D W) which pays for repairing collision damage.

Example:
You have just rented a moving truck for $19.95 per day, $1.19 a mile and $14.95 for the C D W.
You kept the truck for 2 days and traveled 65 miles in the truck and paid $24.95 to refill the gas tank.
What was the total cost of the rental
2 days x $19.95 = $39.90
$1.19 x 65 = $77.35
Gas refill = $24.95
Collision waiver = $14.95
Cost of rental = $157.15

Sometimes people like to calculate the cost per mile ------>
Total cost divided by number of miles ------> $157.15 / by number of miles
$157.15 / 65 = $2.4176923 rounded to $2.42 per mile
If you were to go back to Leasing and the sample problem, we could calculate the cost per mile there also.
Total lease cost divided by miles driven

If the lease allowed 1200 miles a month for 36 months, find the cost per mile?

\[
36 \times 1200 = 43,200 \text{ miles}
\]

\[
\$8,854 \text{ (cost of lease)} = \$0.2049537 \text{ cost per mile}
\]

\[
\frac{43,200 \text{ (total miles)}}{\text{43,200}} = \$0.20 \text{ per mile}
\]

Round to nearest cent ----> $0.20 per mile PLUS THE COST OF GASOLINE

---

**Key Terms**

<table>
<thead>
<tr>
<th>Base price</th>
<th>Options</th>
<th>Destination charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sticker price</td>
<td>Dealer's cost</td>
<td>Collision Damage Waiver</td>
</tr>
</tbody>
</table>

---

**PROBLEMS**

1. Calculate the sticker price
   
   A. Four door sedan with a base price of $39,999.00
   B. Options: $1175, $1499, $2499
   C. Destination charge $375
      
      a. $45,547.00   b. $46,547.00   c. $47,547.00   d. $48,547.00

2. A new car sticker shows a base price of $17,999.00 and options totaling $3,999. The destination charge is $250. Your research shows you that the dealer’s cost is 80% of the base price and 80% of the option’s cost. What is the dealer’s cost?
   
   a. $16,848.40   b. $17,848.00   c. $18,848.00   d. $19,848.00
Elements of Consumer Mathematics

3. You can lease a vehicle for $99 a month for 24 months. Your deposit is $999 plus a title fee of $75 and a license fee of $45. What is your total cost?
   a. $3295.00     b. $3395.00     c. $3495.00     d. $3595.00

4. You have rented a car for five days at $29.99 a day plus $0.15 per mile. The damage waiver costs $7.99 a day. You have driven 798 miles and filled the tank for $32.50 when you returned the car. What is your total cost for renting?
   a. $345.10 cost     b. $344.10 cost     c. $343.10 cost     d. $342.10 cost

5. Calculate the sticker price
   A. Four door sedan with a base price of $14,999.00
   B. Options: $275, $775, $1195
   C. Destination charge $275
      a. $14,519.00     b. $15,519.00     c. $16,519.00     d. $17,519.00

6. A new car sticker shows a base price of $29,999.00 and options totaling $4,999.00. Your research shows you that the dealer’s cost is 90% of the base and 85% of the options. What is the dealer’s cost?
   a. $26,873.50     b. $27,873.50     c. $31,248.25     d. $28,873.50
7. You can lease a vehicle for $399.00 a month for 48 months. Your deposit is $2,000.00 plus a title fee of $135.00 and a license fee of $95.00. What is your total cost?
   a. $20,382.00  
   b. $21,382.00  
   c. $22,382.00  
   d. $23,382.00

You have rented a large truck for your business while your own truck is being repaired. You are paying $49.99 a day for seven days. They are also charging you $0.99 a mile. You drive the truck for 765 miles. You pay $85.00 to fill the tank with gas when you return the rented truck.

8. What is the cost for seven days (without mileage or gasoline charges)?
   a. $349.93  
   b. $350.93  
   c. $351.93  
   d. $352.00

9. What is the mileage cost?
   a. $757.35  
   b. $758.35  
   c. $759.35  
   d. $760.35

10. What is the total cost?
    a. $1191.28  
    b. $1192.28  
    c. $1193.28  
    d. $1194.28
ANSWERS

1. $39,999.00
   1,175.00
   1,499.00
   2,499.00
   + 375.00
   $ 45,547.00

2. 80 % x $17,999 —> $14,399.20
    80 % x $3,999 ----> $  3,199.20
    Destination charge —> $     250.00
    $17,848.40 dealer’s cost

3. $99 X 24 = $2,376.00
   Deposit = $ 999.00
   Title fee = $ 75.00
   License fee = $ 45.00
   total lease cost = $3,495.00

4. 5 days x $29.99 = $149.95
   Miles $0.15 x 798 = $119.70
   Collision $7.99 x 5 = $ 39.95
   gas = $ 32.50
   cost of rental = $342.10
5. $14,999.00
   275.00
   775.00
   1195.00
   + 275.00
   $17,519.00  D

6. 90% x $29,999.00 = $26,999.10
   85% x $4,999.00 = $4,249.15
   $31,248.25  C

7. $399 x 48 = $19,152.00
   Deposit = $2,000.00
   Title fee = $135.00
   License fee = $95.00
   Total lease cost = $21,382.00  B

8. 7 x $46.99 = $349.93  A

9. $0.99 x 765 = $757.35  A

10. $349.93 + $757.35 + $85.00 = $1192.28  B
**LESSON 11 THINGS TO REMEMBER**

The **total price or sticker price** is the total of the base price, the price of all of the options and the destination charge. **Let’s look at this example:**

<table>
<thead>
<tr>
<th>Four door sedan with a base price of</th>
<th>$10,998.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>$375.00, $900.00, $1,025.00</td>
</tr>
<tr>
<td>Destination charge</td>
<td>$399.00</td>
</tr>
<tr>
<td>Base Price</td>
<td>$10,998.00</td>
</tr>
<tr>
<td>Options</td>
<td>$375.00</td>
</tr>
<tr>
<td></td>
<td>$900.00</td>
</tr>
<tr>
<td></td>
<td>$1,025.00</td>
</tr>
<tr>
<td>Destination Charge</td>
<td>$399.00</td>
</tr>
<tr>
<td>Sticker Price</td>
<td>$13,697.00</td>
</tr>
</tbody>
</table>

**Example of dealer cost.**

You want to purchase a new car. The sticker shows a base price of $12,999.00 and options totaling $2,999.00. The destination charge is $375. Your research shows the dealer’s cost is 95% of the base price and 85% of the options cost.

What should you estimate the dealer’s cost as being?

95% of $12,999 = $12,349.05
85% of $2,999 = $2,549.15
Destination charge = $375.00
Total cost for dealer = $15,273.20
Total sticker price = $16,373.00

$16,373 - $15,273 = $1,100 difference between sticker price and dealer’s cost.
**Example of total car lease cost:** You are offered a lease at $199.00 a month for 36 months. Your deposit is $1500.00 plus a title fee of $105.00 and a license fee of $85.00. What is your total cost?

\[ 199 \times 36 = 7,164 \]

- Deposit = $1,500
- Title fee = $105
- License fee = $85

Total lease cost = $8,854

**Cost per mile calculation** If the total cost for lease was $8,854 and the lease allowed 1200 miles a month for 36 months, find the cost per mile?

\[ 36 \times 1200 = 43,200 \text{ miles} \]

\[ \frac{8,854 \text{ (cost of lease)}}{43,200 \text{ (total miles)}} = 0.2049537 \text{ cost per mile} = \$0.20 \]

**Total rental cost for a truck/car rental:** You have just rented a moving truck for $19.95 per day, $1.19 a mile and $14.95 for the Collision Damage Waiver. You kept the truck for 2 days and traveled 65 miles in the truck and paid $24.95 to refill the gas tank.

What was the total cost of the rental?

\[ 2 \text{ days} \times 19.95 = 39.90 \]
\[ 1.19 \times 65 = 77.35 \]
Gas refill = $24.95
Collision waiver = $14.95

**Cost of rental** = $157.15