

CONTENTS

PART I: MATHEMATICS SKILLS / 1

1 Fundamental Arithmetic and Algebra Review	3
Unit 1: Addition in Business	3
Unit 2: Subtraction in Business	13
Unit 3: Multiplication in Business	24
Unit 4: Division in Business	38
Unit 5: Fractions in Business	48
Unit 6: Addition and Subtraction of Fractions and Mixed Numbers	52
Unit 7: Multiplication and Division of Fractions and Mixed Numbers	57
Unit 8: Review of Chapter 1	62
2 Decimals, Percents, Ratios, and Proportions	71
Unit 1: Decimals in Business	71
Unit 2: Percents in Business	75
Unit 3: Ratios and Proportions	86
Unit 4: Review of Chapter 2	90
3 Statistics, Charts, and Graphs	93
Unit 1: Measures of Central Tendency	93
Unit 2: Line Graphs	98
Unit 3: Stem-and-Leaf Plots	102
Unit 4: Bar Graphs and Pictographs	104
Unit 5: Circle (Pie) Graphs	110
Unit 6: Review of Chapter 3	114
4 Measurement—English (U.S. Standard)/Metric Conversion	119
Unit 1: Converting Standard Units	119
Unit 2: Adding and Subtracting Mixed Units	122
Unit 3: Multiplying and Dividing Mixed Units	124
Unit 4: The Metric System	128
Unit 5: Metric–English Conversions	132
Unit 6: Review of Chapter 4	134

PART II: THE MATHEMATICS OF PERSONAL FINANCE / 137

5 Banking and Investments	139
Unit 1: Savings Accounts	139
Unit 2: Checking Accounts	146
Unit 3: Investments—Stocks	153
Unit 4: Investments—Bonds	161
Unit 5: Review of Chapter 5	168

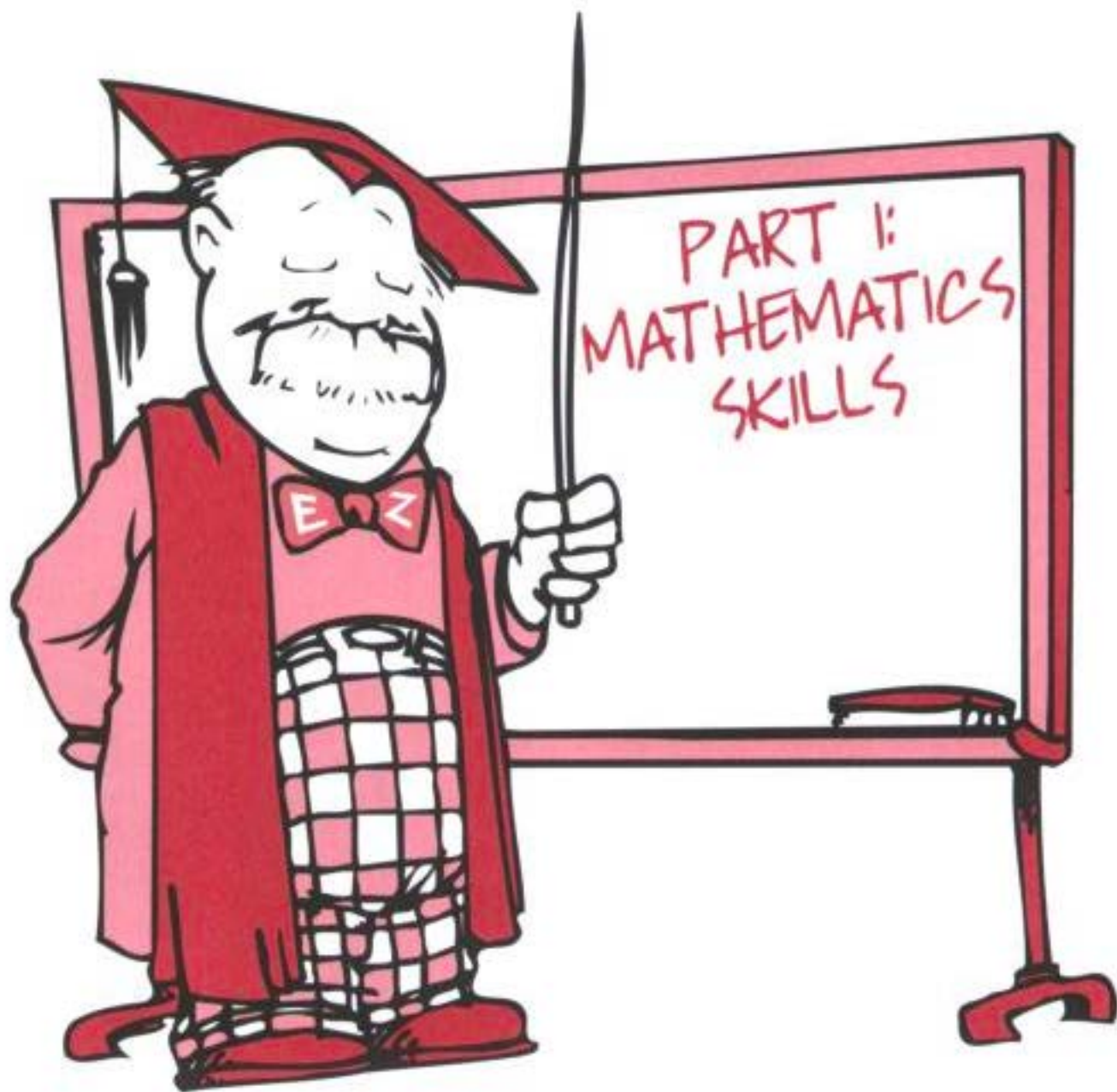
6 Loans and Credit	173
Unit 1: Promissory Notes	173
Unit 2: Borrowing from a Bank	177
Unit 3: Credit Buying	182
Unit 4: Review of Chapter 6	186
7 Home, Car, and Insurance Expenditures	189
Unit 1: Home Ownership	189
Unit 2: Home Insurance	194
Unit 3: Automobile Ownership	197
Unit 4: Automobile Insurance	199
Unit 5: Life Insurance	204
Unit 6: Review of Chapter 7	206

PART III: APPLICATIONS OF MATHEMATICS TO BUSINESS / 209

8 The Mathematics of Retailing	211
Unit 1: Sales Slips	211
Unit 2: Unit Pricing	214
Unit 3: Sale Items	219
Unit 4: Review of Chapter 8	222
9 The Mathematics of Purchasing	225
Unit 1: Purchasing Goods	225
Unit 2: Calculating Trade Discounts	229
Unit 3: Pricing Goods on the Basis of Selling Price	235
Unit 4: Pricing Goods on the Basis of Cost	239
Unit 5: Review of Chapter 9	243
10 The Mathematics of Management and Finance	247
Unit 1: Calculating Payroll Costs	247
Unit 2: Calculating Payroll Deductions	254
Unit 3: Review of Chapter 10	259
11 Basic Bookkeeping	263
Unit 1: The Balance Sheet	263
Unit 2: The Income Statement	269
Unit 3: Inventory	274
Unit 4: Depreciation	280
Unit 5: Review of Chapter 11	285

Answers to Exercises	291
-----------------------------	------------

Index	327
--------------	------------





Fundamental Arithmetic and Algebra Review

Unit 1: Addition in Business

In business, you will use addition every day to be effective. Whether you are calculating how many items in your store you have sold, working up a sales slip or an invoice, calculating the total of a bill (with tip) in a restaurant, or checking a time card, addition skills are critical to your success.

REVIEW OF ADDITION

Fortunately, addition is the easiest of operations to do. Addition is when two or more numbers (called the *addends*) are added together. The result is called the *sum*.

**EXAMPLE
1**

$$\begin{array}{r} \\ 563 \\ + 874 \\ \hline 1437 \end{array} \quad \begin{array}{l} \leftarrow \text{addends} \\ \leftarrow \text{addends} \\ \leftarrow \text{sum} \end{array}$$

You probably will not see the word *addend* ever in business, but you will see the word *sum*. Always line up the columns: the ones, the tens, the hundreds, and so forth.

**EXAMPLE
2**

$$\begin{array}{r} \\ 982 \\ 415 \\ + 377 \\ \hline 1774 \end{array}$$

Most of the time, you will certainly use a calculator to obtain these sums (Indeed, very few business people do math by hand.) However, knowing how addition is done may be helpful. After all, you might find yourself without a calculator one day.

4 Fundamental Arithmetic and Algebra Review

EXAMPLE
3

$$\begin{array}{r} 22 \\ 82 \\ 53 \\ 44 \\ 18 \\ + 37 \\ \hline 234 \end{array}$$

Consider Example 3, above. Many accountants (who need to add large columns of numbers) use this little shortcut: they make groups of 10. Look at the ones column. Pair up 8 and 2 to make 10, pair up 7 and 3 to make another 10, and you are left with a 4. The 4 comes down, and you have 2 to carry. In the tens column, you can pair up 2 and 8, and then add 5, 4, and 1 to make two groups of 10. You are left with 3, which comes down. The 2 is carried to the hundreds place and brought down.

When adding money, line up the decimal places. This is how all decimal addition is carried out: line up the decimal places.

EXAMPLE
4

$$\begin{array}{r} 1 \quad 1 \\ \$673.85 \\ + \$51.51 \\ \hline \$725.36 \end{array}$$



CHECKING ADDITION

You should always check your addition, and it is easy to do with a calculator. The easiest way to check your addition is to add up the numbers in *reverse order*. That way, if the two sums you get agree, the chances are that you got it right. If the two sums do not agree, then you might consider adding the numbers again to find out which is the correct sum.



CALCULATOR OPTION

Checking an addition problem with a calculator is easy. In fact, not too many people do calculations on paper. Most use calculators. To check example 4 above, simply type in the numbers:

$$\boxed{6}\boxed{7}\boxed{3}\boxed{.}\boxed{8}\boxed{5} + \boxed{5}\boxed{1}\boxed{.}\boxed{5}\boxed{1} = \boxed{7}\boxed{2}\boxed{5}\boxed{.}\boxed{3}\boxed{6}$$

The individual keystrokes for the numbers and symbols are boxed. Some calculators will show dollar signs in the display, but most will not.



SPREADSHEET OPTION

A computer gives you another option for addition: a computer-based spreadsheet. Putting numbers into a computer spreadsheet can be easy, but it also can be time consuming. You must judge whether the time setting up the computer spreadsheet is worth the benefits in calculating the sum that way.

EXAMPLE
3
AGAIN

Here is example 3 on a spreadsheet.

82
53
44
18
37
234

The numbers were entered into the spreadsheet. The SUM function was used. The function looks like this on the standard toolbar: Σ .

When you use a spreadsheet, you must be *extra careful* to make sure the numbers have been entered correctly. If not, you might get an erroneous result and lose the business deal (worth millions, perhaps). It has happened in business many times before. **Always double-check your work.**



EXERCISES

Try these exercises on a calculator, on paper, *and* on a spreadsheet to determine which method you prefer.

Exercise A Solve the following problems, indicating zero cent where necessary, and check your answers:

1. $\$63.75 + \$28.15 + \$35.82 + \73.47
2. $\$232.43 + \$364 + \$472.10 + \527
3. $\$607.75 + \$28 + \$327.85 + \215
4. $\$48.73 + \$2,070 + \$628.47 + \372
5. $\$35 + \$347.80 + \$8,923$

6 Fundamental Arithmetic and Algebra Review

6. $\$4,623.49 + \$793.78 + \$93 + \78.50
7. $\$649.57 + \$84 + \$5,627.26 + \$10,738.47$
8. $\$6,327.56 + \$14,246.76 + \$976 + \$18,648.95$
9. $\$6,456.36 + \$49,275.49 + \$876 + \$9,786.68$
10. $\$5,458.63 + \$7,568 + \$43,786.17 + \596.56

Exercise B Find the total for each of the following forms, and check your answers:

Sample Problem

11.

Expense Records Week of 9/19		
Salesperson	Amount	
Anderson, B.	\$63	50
Bates, G.	71	68
Berger, M.	94	32
Carter, J.	87	55
Chambers, V.	74	19
Total	\$391	24

Check

$$\begin{array}{r}
 63 \square 5 \\
 \oplus \\
 71 \square 68 \\
 \oplus \\
 94 \square 32 \\
 \oplus \\
 87 \square 55 \\
 \oplus \\
 74 \square 19 \\
 \oplus \\
 \hline
 \checkmark 391.24
 \end{array}$$

12.

Expense Records Week of 10/3		
Salesperson	Amount	
Anderson, B.	\$88	50
Bates, G.	91	50
Berger, M.	84	82
Carter, J.	77	44
Chambers, V.	64	29
Total		

13.

Date: September 3				
Salesperson	Sales		Commission	
Anderson, B.	\$15,685	75	\$1,568	58
Bates, G.	13,856	80	1,385	68
Berger, M.	18,560	44	1,856	04
Carter, J.	14,375	86	1,437	59
Chambers, V.	15,963	45	1,596	35
Totals				

14.

Inventory	
Item	Quantity
25-Watt Bulbs	75
40-Watt Bulbs	123
60-Watt Bulbs	115
75-Watt Bulbs	98
100-Watt Bulbs	135
Total	

15.

Inventory	
Item	Quantity
Men's Ties #62	2,478
Men's Ties #68	987
Men's Ties #71	3,628
Men's Ties #74	5,870
Men's Ties #78	697
Men's Ties #81	874
Men's Ties #85	1,320
Men's Ties #90	2,054
Total	

Find the subtotal and the total for the following form:

16.

HANDY & SONS		
<i>March 28</i> 20--		
SOLD TO <i>P. Griffiths</i>		
ADDRESS <i>1031 Brookfield Ave.</i>		
CLERK <i>M.W.</i>	DEPT <i>33</i>	AMT REC'D <i>\$105</i>
QUAN.	DESCRIPTION	AMOUNT
<i>3</i>	<i>Sport Shirts</i>	<i>\$26 85</i>
<i>6</i>	<i>Pair of Socks</i>	<i>11 70</i>
<i>2</i>	<i>Ties</i>	<i>18 00</i>
<i>1</i>	<i>Pair of Shoes</i>	<i>36 95</i>
	Subtotal	
	8% Sales tax	<i>7 48</i>
	Total	
POSITIVELY NO EXCHANGES MADE UNLESS THIS SLIP IS PRESENTED WITHIN 3 DAYS.		

Word Problems

Word problems are easier to solve if you watch for key phrases. For instance, key phrases indicating addition are:

“Find the total.”

“What is the cost of . . . ?”

Use addition if you are given a set of numbers in the same units (money, hours, parts, etc.) and are asked for the *total*, the *sum*, or the (*total*) *cost*.

Exercise C Solve the following problems:

- A company bought two typewriters for \$1,525 each, a desk for \$785.90, a chair for \$124.75, and an adding machine for \$1,250.95. Find the total amount of the purchases.
- The Taylor Building Company deposited the following checks: \$315.80, \$475.60, \$115.28, \$287.60, \$330.50, and \$98.15. What was the total amount of the deposit?
- Sam Steinfeld has the following deductions from his weekly paycheck: federal withholding tax, \$42.50; Social Security, \$12.75; state tax, \$14.10; city tax, \$8.75; medical insurance, \$2.40. Find the total of his payroll deductions.
- The breakdown of the Alvarez family's monthly mortgage payment is as follows: reduction of principal, \$98.75; interest charges, \$138.63; escrow for real estate tax, \$113.78; and mortgage insurance premium, \$13.52. How much is the total monthly payment?
- Sharon earns part of her salary from commissions based on sales. Last week she earned the following commissions: \$35.63, \$41.50, \$23.78, \$47.83, and \$38.35. She also earns a base salary of \$125, to which the commissions are added. What was Sharon's total salary last week?

HORIZONTAL AND VERTICAL ADDITION

Many business forms are designed with sums to be added *horizontally* (across the page) and totaled in the right-hand column. Very often, these forms also require *vertical* addition, totaled under each column. This is an automatic check on your accuracy. If the two totals do not agree, you have made a mistake in addition.

CHECKING HORIZONTAL ADDITION

As in vertical addition, you should check your accuracy by adding the numbers in the reverse direction.



Answers to Exercises

Chapter 1, Unit 1

- Exercise A** 1. \$201.19 2. \$1,595.53 3. \$1,178.60 4. \$3,119.20
5. \$9,305.80 6. \$5,588.77 7. \$17,099.30 8. \$40,199.27
9. \$66,394.53 10. \$57,409.36
- Exercise B** 11. \$391.24 12. \$406.55 13. Sales: \$78,442.30;
Commission: \$7,844.24 14. 546 15. 17,908
16. Subtotal: \$93.50; Total: \$100.98
- Exercise C** 17. \$5,211.60 18. \$1,622.93 19. \$80.50 20. \$364.68
21. \$312.09
- Exercise D** 22. 35 23. 225 24. 323 25. 21,962 26. 88,065
27. 130,935 28. 175,968 29. 91,277 30. 150,720
- Exercise E** 31. Adams: 50; Adman: 45; Burke: 41; Curtis: 44; Dellman: 44;
Evans: 46
Mon.: 53; Tues.: 49; Wed.: 61; Thurs.: 52; Fri.: 55;
Grand Total: 270
32. 01: \$70.87; 02: \$83.70; 03: \$84.93; 04: \$77.01;
05: \$105.84; 06: \$102.90; 07: \$88.23; 08: \$111.78;
09: \$77.51; 10: \$106.85 Fed. Tax: \$462.26;
FICA Tax: \$158.35; State Tax: \$106.15; City Tax:
\$67.94; Pension: \$83.75; Health Plan: \$31.17;
Grand Total: \$909.62
33. Grocery: \$13,556.32; Produce: \$6,248.82; Dairy: \$10,080.39;
Meat: \$8,688.70; Deli: \$5,339.13; Nonfood: \$4,625.11
Mon.: \$7,631.68; Tues.: \$7,477.31; Wed.: \$6,905.38;
Thurs.: \$7,162.70; Fri.: \$6,848.84; Sat.: \$6,371.98;
Sun.: \$6,140.58; Grand Total: \$48,538.47