Contemporary Mathematics for Business and Consumers 8th edition Brechner Solutions Manual

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EXAMPLE 2 ROUNDING WHOLE NUMBERS

Round the following numbers to the indicated place.

a. 1,867 to tens
b. 760 to hundreds
c. 129,338 to thousands
d. 293,847 to hundred thousands
e. 97,078,838,576 to billions
f. 85,600,061 all the way

SOLUTION STRATEGY

Following the steps on page 4, locate the place to be rounded, use the digit to the right of that place to determine whether to round up or leave it as is, and change all digits to the right of the place being rounded to zeros.

		Place Indicated	Rounded Number
a.	1,867 to tens	1,86$\underline{7}$	1,870
b.	760 to hundreds	7$\underline{6}$0	800
c.	129,338 to thousands	12$\underline{9}$,338	129,000
d.	293,847 to hundred thousands	$\underline{2}$93,847	300,000
e.	97,078,838,576 to billions	$\underline{9}$7,078,838,576	97,000,000,000
f.	85,600,061 all the way	$\underline{8}$5,600,061	90,000,000

TRY IT EXERCISE 2

Round the following numbers to the indicated place.

a. 51,667 to hundreds
b. 23,441 to tens
c. 175,445,980 to ten thousands
d. 59,561 all the way
e. 14,657,000,138 to billions
f. 8,009,070,436 to ten millions

CHECK YOUR ANSWERS WITH THE SOLUTIONS ON PAGE 24.

CLASSROOM ACTIVITY

For practice, have students round the numbers in the chart "Pricey Diplomas" to various places.

CLASSROOM ACTIVITY

Ask students to think of situations in which rounding or estimating would be useful. Typical responses might include

- totaling a check in a restaurant
- deciding how much food and beverages to buy for a party
- planning the purchase of materials for a construction project

REVIEW EXERCISES 1 SECTION I

Read and write the following whole numbers in numerical and word form.

	Number	Numerical Form	Word Form
1.	22938	22,938	Twenty-two thousand, nine hundred thirty-eight
2.	1573	1,573	One thousand, five hundred seventy-three
3.	184	184	One hundred eighty-four
4.	984773	984,773	Nine hundred eighty-four thousand, seven hundred seventy-three
5.	2433590	2,433,590	Two million, four hundred thirty-three thousand, five hundred ninety
6.	49081472	49,081,472	Forty-nine million, eighty-one thousand, four hundred seventy-two



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Write the following whole numbers in numerical form.

7. One hundred eighty-three thousand, six hundred twenty-two — 183,622
8. Seven million, sixty-one thousand, ten — 7,061,010
9. According to Globo's G1 website, expenses in preparation for the 2014 World Cup in Brazil reached forty billion dollars. Write this number in numerical form. — $40,000,000,000

Match the following numbers in word form with the numbers in numerical form.

10. One hundred two thousand, four hundred seventy ___b___
11. One hundred twelve thousand, seven hundred forty-three ___d___
12. Twelve thousand, seven hundred forty-three ___a___
13. Eleven thousand, two hundred seventy ___c___
14. According to NCR Corporation, retailers in America generate 228,700,000 pounds of paper receipts per year. Write this number in word form.

    Two hundred twenty-eight million, seven hundred thousand pounds

a. 12,743
b. 102,470
c. 11,270
d. 112,743

Round the following numbers to the indicated place.

15. 1,757 to tens — 1,760
16. 32,475 to thousands — 32,000
17. 812,461 to hundreds — 812,500
18. 559,443 to ten thousands — 560,000
19. 25,812,922 to millions — 26,000,000
20. 45,699 all the way — 50,000
21. 1,325,669,226 to hundred millions — 1,300,000,000
22. 23,755 all the way — 20,000
23. According to the American Wind Energy Association, Texas has the highest operating wind capacity, 8,797 megawatts. Iowa is second with 3,053 megawatts capacity.

    a. Write each of these numbers in word form.

    Texas: eight thousand, seven hundred ninety-seven megawatts

    Iowa: three thousand, fifty-three megawatts

    b. Round each of these numbers to the nearest hundred.

    Texas: 8,800 megawatts

    Iowa: 3,100 megawatts

24. According to the *Financial Times*, in a recent recession, outstanding consumer credit in the United States fell to $2,460,000,000,000—the seventh straight monthly decline. Most of the drop came as a result of consumers paying down revolving debt such as credit cards.

    a. Write this number in word form.

    Two trillion, four hundred sixty billion dollars

    b. Round this number to the nearest hundred billion.

    $2,500,000,000,000

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BUSINESS DECISION: UP OR DOWN?

25. You are responsible for writing a monthly stockholders' report about your company. Your boss has given you the flexibility to round the numbers to tens, hundreds, thousands, and so on, or not at all, depending on which is most beneficial for the company's image. For each of the following monthly figures, make a rounding choice and explain your reasoning.

a. 74,469—number of items manufactured	100s; 74,500 Items
b. $244,833—your department's net sales for the month	1,000s; $245,000 Sales
c. 5,648—defective items manufactured	100s; 5,600 Defects
d. $649,341—total company profit	10,000s; $650,000 Profit
e. 149 new customers	10s; 150 New customers

TEACHING TIP
Answers may vary. This is a good time to discuss how far numbers should be rounded in various situations.

1 Addition and Subtraction of Whole Numbers

SECTION II

Addition and subtraction are the most basic mathematical operations. They are used in almost all business calculations. In business, amounts of things or dollars are often combined or added to determine the total. Likewise, subtraction is frequently used to determine an amount of something after it has been reduced in quantity.

Adding Whole Numbers and Verifying Your Answers

1-3

Addition is the mathematical process of computing sets of numbers to find their sum, or total. The numbers being added are known as **addends**, and the result or answer of the addition is known as the **sum**, **total**, or **amount**. The "+" symbol represents addition and is called the **plus sign**.

addition The mathematical process of computing sets of numbers to find their sum, or total.

addends Any of a set of numbers being added in an addition problem. For example, 4 and 1 are the addends of the addition problem 4 + 1 = 5.

sum, total, or amount The result or answer of an addition problem. The number 5 is the sum, or total, of 4 + 1 = 5.

plus sign The symbol "+" representing addition.

$$\begin{array}{rl} 1{,}932 & \text{addend} \\ 2{,}928 & \text{addend} \\ +\ 6{,}857 & \text{addend} \\ \hline 11{,}717 & \text{total} \end{array}$$

STEPS FOR ADDING WHOLE NUMBERS

STEP 1. Write the whole numbers in columns so that you line up the place values—units, tens, hundreds, thousands, and so on.

STEP 2. Add the digits in each column, starting on the right with the units column.

STEP 3. When the total in a column is greater than nine, write the units digit and carry the tens digit to the top of the next column to the left.

VERIFYING ADDITION

Generally, when adding the digits in each column, we add from top to bottom. An easy and commonly used method of verifying your addition is to add the numbers again, but this time from bottom to top. By adding the digits in the *reverse* order, you will reduce the chance of making the same error twice.

For illustrative purposes, addition verification will be rewritten in reverse. In actuality, you do not have to rewrite the numbers; just add them from bottom to top. As mentioned earlier, you will achieve speed and accuracy with practice.

Learning Tip

Once you become proficient at verifying addition, you can speed up your addition by recognizing and combining two numbers that add up to 10, such as 1 + 9, 2 + 8, 6 + 4, and 5 + 5. After you have mastered combining two numbers, try combining three numbers that add up to 10, such as 3 + 3 + 4, 2 + 5 + 3, and 4 + 4 + 2.

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Learning Tip

Because each place value increases by a factor of 10 as we move from right to left (units, tens, hundreds, etc.), when we borrow a digit, we can think of it as borrowing a 10.

COLLABORATIVE LEARNING ACTIVITY

Here's a challenge that may be appropriate for some students. In groups, have students formulate a strategy and complete this addition problem. Each letter represents a different digit.

```
  NUT
+ SUN
 NEAR
```

where U = 3 and T = 4

Solution

The strategy is to find the value of "N" first by deciding what its value as the first digit in "NEAR" must be.

```
  134
+ 931
 1,065
```

SOLUTIONSTRATEGY

a.
```
    8
 4,968
-  192
 4,776
```

Verification:
```
   1
 4,776
+  192
 4,968
```

Write the numbers in columns so that the place values are lined up. In this problem, they are already lined up.
Starting with the units column, subtract the digits.
Units column: 8 – 2 = 6. Enter the 6 under the units column.
Tens column: 6 – 9 can't be subtracted, so we must borrow a digit, 10, from the hundreds column of the minuend. This reduces the 9 to an 8 and gives us a 10 to add to the 6, making it 16.
Now we can subtract 9 from 16 to get 7. Enter the 7 under the tens column.
Hundreds column: 8 – 1 = 7. Enter the 7 under the hundreds column.
Thousands column: This column has no subtrahend, so just bring down the 4 from the minuend to the answer line.

b.
Subtraction	Verification
33	11
189,440	188,093
− 1,347	+ 1,347
188,093	189,440

c.
Subtraction	Verification
0	1
165	94
− 71	+ 71
94	165

TRYITEXERCISE 4

Subtract the following whole numbers and verify your answers.

a.
```
 98,117
- 7,682
```

b. 12,395 − 5,589

c. Joe Montgomery has $4,589 in his checking account. If he writes a check for $344, how much will be left in the account?

CHECK YOUR ANSWERS WITH THE SOLUTIONS ON PAGE 24.

SECTION II 1 REVIEW EXERCISES

Add the following numbers.

1.
```
  45
  27
+ 19
  91
```

2.
```
   548
   229
 4,600
+ 62,660
  68,037
```

3.
```
   339
 1,236
 5,981
 3,597
+ 8,790
 19,943
```

4.
```
 2,359
 8,511
+ 14,006
 24,876
```

5.
```
   733
   401
 1,808
24,111
+ 10,595
 37,648
```

6. 2,339 + 118 + 3,650 + 8,770 + 81 + 6 = 14,964

```
 2,339
   118
 3,650
 8,770
    81
+    6
14,964
```

7. 12,554 + 22,606 + 11,460 + 20,005 + 4,303 = 70,928

```
12,554
22,606
11,460
20,005
+ 4,303
70,928
```

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Estimate the following by rounding each number all the way; then add to find the exact answer.

		Estimate	Rounded Estimate	Exact Answer
8.	288 512 3,950 + 1,944 6,694	300 500 4,000 + 2,000 6,800	6,800	6,694
9.	27,712 5,281 + 368 33,361	30,000 5,000 + 400 35,400	35,400	33,361
10.	318,459 + 283,405 601,864	300,000 + 300,000 600,000	600,000	601,864

11. City traffic engineers in Canmore are doing an intersection traffic survey. On Tuesday, a counter placed at the intersection of Armstrong Place and Three Sisters Blvd. registered the following counts: morning, 2,594; afternoon, 2,478; and evening, 1,863.
    a. Round each number to the nearest hundred and add to get an *estimate* of the traffic count for the day.

2,600
2,500
+ 1,900
7,000 Vehicles

    b. What was the *exact* amount of traffic for the day?

2,594
2,478
+ 1,863
6,935 Vehicles

12. While shopping, Tyler Hammond purchases items for $3, $24, $13, $2, and $175. How much did he spend?

3
24
13
2
+ 175
$217 Total spent

13. The following chart shows the April, May, and June sales figures by service categories for Pandora's Beauty Salon. Total each row to get the category totals. Total each column to get the monthly totals. Calculate the grand total for the three-month period.

Pandora's Beauty Salon

Service Category	April	May	June		Category Totals
Cutting, Styling, Coloring	$13,515	$12,350	$14,920		$40,785
Manicure, Pedicure, Waxing	5,418	7,640	5,756		18,814
Facials and Makeup	4,251	6,125	6,740		17,116
Beauty Supplies	8,690	7,254	10,346		26,290
Monthly Totals	$31,874	$33,369	$37,762	**Grand Total**	$103,005



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Service Sector According to the *CIA World Factbook*, service sector businesses such as beauty salons and dry cleaners account for 79.6% of the U.S. economy's gross domestic product. Other sectors include industrial at 19.2% and agriculture at 1.2%.

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14. At Cherry Valley Farms, a farmer plants 350 acres of soybeans, 288 acres of corn, 590 acres of wheat, and 43 acres of assorted vegetables. In addition, the farm has 9 acres for grazing and 4 acres for the barnyard and farmhouse. What is the total acreage of the farm?

```
  350
  288
  590
   43
    9
+   4
 1,284  Total acres
```

15. Service Masters Carpet Cleaners pays its sales staff a salary of $575 per month, plus commissions. Last month Alex Acosta earned commissions of $129, $216, $126, $353, and $228. What was Alex's total income for the month?

```
  575
  129
  216
  126
  353
+ 228
$1,627  Total income
```

Subtract the following numbers.

16. 354 − 48 = 306

17. 5,596 − 967 = 4,629

18. 95,490 − 73,500 = 21,990

19. 339,002 − 60,911 = 278,091

20. 2,000,077 − 87,801 = 1,912,276

21. $206 minus $58

```
  206
− 58
 $148
```

22. 67,800 – 9,835

```
  67,800
− 9,835
  57,965
```

23. $127 less $33

```
  127
− 33
 $94
```

24. Subtract 5,868 from 10,918

```
  10,918
− 5,868
   5,050
```

25. Subtract 8,906,000 from 12,396,700

```
  12,396,700
− 8,906,000
   3,490,700
```

26. The beginning inventory of the Designer Shoe Salon for August was 850 pairs of shoes. On the 9th, it received a shipment from the factory of 297 pairs. On the 23rd, another shipment of 188 pairs arrived. When inventory was taken at the end of the month, there were 754 pairs left. How many pairs of shoes were sold that month?

```
  850  Beginning inventory
  297 }
+ 188 } Shipments received
1,335  Total inventory

1,335  Total inventory
− 754  Ending inventory
  581  Pairs sold
```

Dollars AND Sense

The American Association of Retired Persons offers financial advice targeted at those in their 20s and 30s at www.aarp.org/money. The site contains tips from financial experts as well as calculators to help you budget and determine ways to reduce debt.

27. An electrician, Sparky Wilson, starts the day with 650 feet of wire on his truck. In the morning, he cuts off pieces 26, 78, 45, and 89 feet long. During lunch, he goes to an electrical supply warehouse and buys another 250 feet of wire. In the afternoon, he uses lengths of 75, 89, and 120 feet. How many feet of wire are still on the truck at the end of the day?

```
  26
  78
  45
+ 89
 238  Morning feet used

  650
− 238
  412  Morning feet left

  412
+ 250
  662  Afternoon start

   75
   89
+ 120
  284  Afternoon feet used

  662
− 284
  378  Feet left end of day
```

28. Use the U.S. Postal Service Mail Volume graph on the next page to answer the following questions.
a. How many pieces were delivered in 2005 and 2006 combined?

```
  212
+ 213
  425 Billion
```

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b. How many fewer pieces were delivered in 2009 than in 2007?

$$\begin{array}{r} 212 \\ -\ 180 \\ \hline 32 \end{array}$$ Billion

c. Write the number of pieces of mail for 2008 in numerical form.

203,000,000,000

29. Eileen Townsend is planting her flower beds. She initially bought 72 bedding plants at Home Depot.
a. If she plants 29 in the front bed, how many plants remain unplanted?

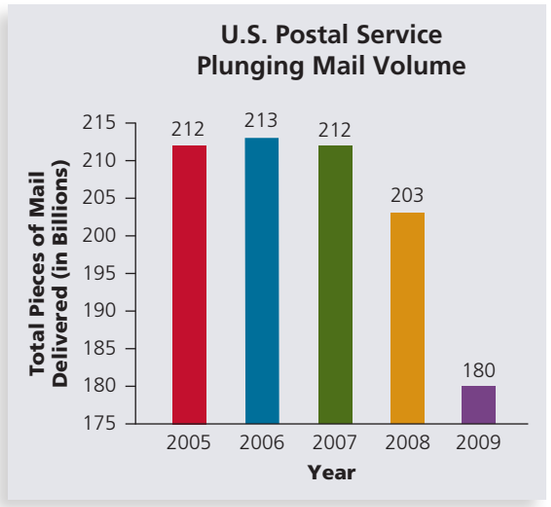
$$\begin{array}{r} 72 \\ -\ 29 \\ \hline 43 \end{array}$$ Plants

b. Eileen's remaining flower beds have room for 65 bedding plants. How many more plants must she buy to fill up the flower beds?

$$\begin{array}{r} 65 \\ -\ 43 \\ \hline 22 \end{array}$$ Plants

c. How many total plants did she buy?

$$\begin{array}{r} 72 \\ +\ 22 \\ \hline 94 \end{array}$$ Plants



Rapidly Decreasing Postal Volume This chart illustrates the dramatic decrease in U.S. postal mail volume as e-mail and other electronic transfers of information became more widely used.
Source: *U.S. Postal Service*

30. An Allied Vans Lines moving truck picks up loads of furniture weighing 5,500 pounds, 12,495 pounds, and 14,562 pounds. The truck weighs 11,480 pounds, and the driver weighs 188 pounds. If a bridge has a weight limit of 42,500 pounds, is the truck within the weight limit to cross the bridge?

$$\begin{array}{r} 5{,}500 \\ 12{,}495 \\ 14{,}562 \\ 11{,}480 \\ +\ \ 188 \\ \hline 44{,}225 \end{array}$$ Pounds total weight

$$\begin{array}{r} -\ 44{,}225 \\ -\ 42{,}500 \\ \hline 1{,}725 \end{array}$$ Pounds over weight limit

No, the truck is overweight.

BUSINESS DECISION: PERSONAL BALANCE SHEET

31. A *personal balance sheet* is the financial picture of how much "wealth" you have accumulated as of a certain date. It specifically lists your *assets* (i.e., what you own) and your *liabilities* (i.e., what you owe). Your current *net worth* is the difference between the assets and the liabilities.

Net worth = Assets – Liabilities

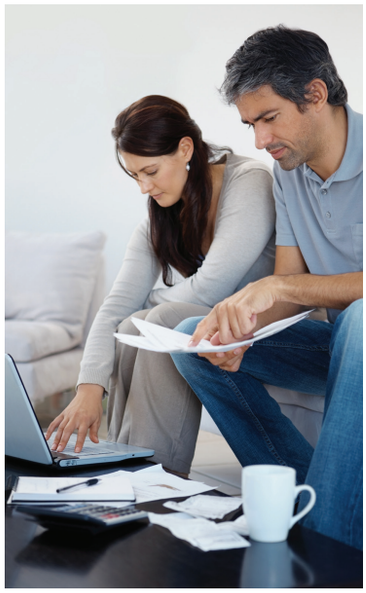
Tom and Carol Jackson have asked for your help in preparing a personal balance sheet. They have listed the following assets and liabilities: current value of home, $144,000; audio/video equipment, $1,340; automobiles, $17,500; personal property, $4,350; computer, $3,700; mutual funds, $26,700; 401(k) retirement plan, $53,680; jewelry, $4,800; certificates of deposit, $19,300; stock investments, $24,280; furniture and other household goods, $8,600; balance on Wal-Mart and Sears charge accounts, $4,868; automobile loan balance, $8,840; home mortgage balance, $106,770; Visa and MasterCard balances, $4,211; savings account balance, $3,700; Carol's night school tuition loan balance, $2,750; checking account balance, $1,385; signature loan balance, $6,350.

Use the data provided and the personal balance sheet on page 14 to calculate the following for the Jacksons.

a. Total assets $313,335
b. Total liabilities $133,789
c. Net worth $179,546

d. Explain the importance of the personal balance sheet. How often should this information be updated?
Monthly—or at least quarterly; answers will vary.

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Just as with corporate statements, **personal financial statements** are an important indicator of your financial position. The balance sheet, income statement, and cash flow statement are most commonly used. When compared over a period of time, they tell a story of where you have been and where you are going financially.

PERSONAL BALANCE SHEET

ASSETS			LIABILITIES		
CURRENT ASSETS			**CURRENT LIABILITIES**		
Checking account	1,385		Store charge accounts	4,868	
Savings account	3,700		Credit card accounts	4,211	
Certificates of deposit	19,300		Other current debt		
Other			**Total Current Liabilities**		9,079
Total Current Assets		24,385	**LONG-TERM LIABILITIES**		
LONG-TERM ASSETS			Home mortgage	106,770	
Investments			Automobile loan	8,840	
Retirement plans	53,680		Education loan	2,750	
Stocks	24,280		Other loan	6,350	
Bonds			Other loan		
Mutual funds	26,700		**Total Long-Term Liabilities**		124,710
Other			**TOTAL LIABILITIES**		$133,789
Personal					
Home	144,000				
Automobiles	17,500				
Furniture	8,600				
Personal property	4,350				
Jewelry	4,800				
Other	1,340		**NET WORTH**		
Other	3,700		**Total Assets**	313,335	
Total Long-Term Assets		288,950	**Total Liabilities**	− 133,789	
TOTAL ASSETS		$313,335	**NET WORTH**		$179,546

SECTION III 1 Multiplication and Division of Whole Numbers

Multiplication and division are the next two mathematical procedures used with whole numbers. Both are found in business as often as addition and subtraction. In reality, most business problems involve a combination of procedures. For example, invoices, which are a detailed list of goods and services sold by a company, require multiplication of items by the price per item and then addition to reach a total. From the total, discounts are frequently subtracted or transportation charges are added.

1-5 Multiplying Whole Numbers and Verifying Your Answers

multiplication The combination of two numbers in which the number of times one is represented is determined by the value of the other.

multiplicand In multiplication, the number being multiplied. For example, 5 is the multiplicand of $5 \times 4 = 20$.

Multiplication of whole numbers is actually a shortcut method for addition. Let's see how this works. If a clothing store buys 12 pairs of jeans at $29 per pair, what is the total cost of the jeans? One way to solve this problem is to add $\$29 + \$29 + \ldots$, 12 times. It's not hard to see how tedious this repeated addition becomes, especially with large numbers. By using multiplication, we get the answer in one step: $12 \times 29 = \$348$.

Multiplication is the combination of two whole numbers in which the number of times one is represented is determined by the value of the other. These two whole numbers are known as factors. The number being multiplied is the **multiplicand**, and the number by which

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TRY IT EXERCISE 6

Divide the following numbers and verify your answers.

a. $910 \div 35$ b. $1{,}503 \div 160$ c. $\frac{3{,}358}{196}$ d. $\frac{175}{12}$

e. Delta Industries has 39 production line workers, each making the same amount of money. If last week's total payroll amounted to $18,330, how much did each employee earn?

CHECK YOUR ANSWERS WITH THE SOLUTIONS ON PAGE 25.

REVIEW EXERCISES 1 SECTION III

Multiply the following numbers and verify your answers.

1. $589 \times 19 = 11{,}191$
2. $1{,}292 \times 158 = 204{,}136$
3. $327 \times 900 = 294{,}300$
4. $76{,}000 \times 45 = 3{,}420{,}000$
5. $56{,}969 \times 1{,}000 = 56{,}969{,}000$

6. Multiply $6 by 1004.
$1{,}004 \times 6 = \$6{,}024$

7. 42×610
$610 \times 42 = 25{,}620$

8. What is 475 times 12?
$475 \times 12 = 5{,}700$

Estimate the following by rounding each number all the way; then multiply to get the exact answer.

		Estimate	Rounded Estimate	Exact Answer
9.	$202 \times 490 = 98{,}980$	$200 \times 500 = 100{,}000$	100,000	98,980
10.	$515 \times 180 = 92{,}700$	$500 \times 200 = 100{,}000$	100,000	92,700
11.	$17 \times 11 = 187$	$20 \times 10 = 200$	200	187

12. Dazzling Designs made custom drapery for a client using 30 yards of material.

a. At $5 per yard, what is the cost of the material?

$30 \times 5 = \$150$

b. If the company received 4 more orders of the same size, how much material will be needed to fill the orders?

$30 \times 4 = 120$ Yards

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13. The U.S. Department of Transportation has a rule designed to reduce passenger discomfort and inconvenience. It states that airlines must let passengers off domestic flights when they have waited three hours without taking off. Airlines that don't comply can be fined up to $27,500 per passenger.

If a Premium Airlines 767 aircraft with 254 passengers on board was fined the maximum penalty for waiting four hours on the tarmac at JFK before takeoff last Tuesday, what was the amount of the fine?

$27{,}500 \times 254 = \underline{\$6{,}985{,}000}$

14. There are 34 stairs from bottom to top in each of five stairways in the football bleachers at Waycross Stadium. If each track team member is to run four complete sets up and down each stairway, how many stairs will be covered in a workout?

$34 \times 5 \times 4 \times 2 = \underline{1{,}360}$ Stairs

15. To earn extra money while attending college, you work as a cashier in a restaurant.

a. Find the total bill for the following food order: three sirloin steak dinners at $12 each; two baked chicken specials at $7 each; four steak burger platters at $5 each; two extra salads at $2 each; six drinks at $1 each; and tax of $7.

Steaks	$3 \times 12 = 36$
Chicken	$2 \times 7 = 14$
Burgers	$4 \times 5 = 20$
Salads	$2 \times 2 = 4$
Drinks	$6 \times 1 = 6$
Tax	$+ 7$
	$\underline{\$87}$ Total

b. How much change will you give back if the check is paid with a $100 bill?

$$\begin{array}{r} 100 \\ -\ 87 \\ \hline \$13 \end{array}$$ Change

16. Bob Powers, a consulting electrical engineer, is offered two different jobs. Abbott Industries has a project that pays $52 per hour and will take 35 hours to complete. Micro Systems has a project that pays $44 per hour and will take 45 hours to complete. Which offer has a greater gross income and by how much?

Abbott Industries: $\$52 \times 35 \text{ hours} = \$1{,}820$
Micro Systems: $\$44 \times 45 \text{ hours} = \$1{,}980$
$1{,}980 - 1{,}820 = \$160$
The Micro Systems project has the greater income by $160.

Divide the following numbers.

17. $4{,}500 \div 35$

$$35\overline{)4500}$$
128 R 20
35
100
70
300
280
20

18. $74{,}770 \div 5{,}700$

$$5700\overline{)74770}$$
13 R 670
5700
17770
17100
670

19. $\dfrac{6{,}000}{25}$

$$25\overline{)6000}$$
240
50
100
100
00

20. $\dfrac{2{,}365}{43}$

$$43\overline{)2365}$$
55
215
215
215
0

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Estimate the following by rounding each number to hundreds; then divide to get the exact answer.

	Estimate	Rounded Estimate	Exact Answer
21. 890 ÷ 295	$\frac{900}{300}$	3	3 R 5
22. 1,499 ÷ 580	$\frac{1{,}500}{600}$	2 R 300	2 R 339
23. 68,246 ÷ 112	$\frac{68{,}200}{100}$	682	609 R 38

24. Tip-Top Roofing has 50,640 square feet of roofing material on hand. If the average roof requires 8,440 square feet of material, how many roofs can be installed?

$\frac{50{,}640}{8{,}440} = 6$ Roofs

25. A calculator uses eight circuit boards, each containing 450 parts. A company has 421,215 parts in stock.
    a. How many calculators can it manufacture?

$\begin{array}{r} 450 \\ \times \quad 8 \\ \hline 3{,}600 \end{array}$ Parts per calculator

$\frac{421{,}215}{3{,}600} = 117$ R 15

177 Calculators

    b. How many parts will be left over?

15 Parts left

26. Eric Shotwell borrows $24,600 from the Mercantile Bank and Trust Co. The interest charge amounts to $8,664. What equal monthly payments must Eric make in order to pay back the loan, with interest, in 36 months?

$\begin{array}{r} 24{,}600 \\ + \quad 8{,}664 \\ \hline \$33{,}264 \end{array}$ Total payback

$\frac{33{,}264}{36} = \$924$ Per month

27. A 16-person college basketball team is going to a tournament in Boston. As the team manager, you are trying to find the best price for hotel rooms. The Windsor Hotel is quoting a price of $108 for 2 people in a room and $10 for each extra person. The Royale Hotel is quoting a price of $94 for 2 people in a room and $15 for each extra person. If the maximum number of people allowed in a room is 4, which hotel would be more economical?

Rooms needed: $\frac{16}{4} = 4$ Rooms

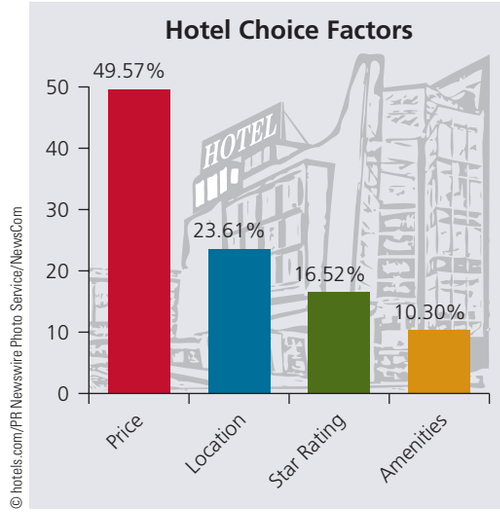
Windsor Hotel: $108 room rate + 2 extra people @ $10 each = $128 Per room

4 rooms × $128 per room = $512

Royale Hotel: $94 room rate + 2 extra people @ $15 each = $124 Per room

4 rooms × $124 per room = $496

The Royale Hotel is more economical.



Hotels.com Survey When selecting a hotel, what do you consider most important?

28. You have just purchased a 65-acre ranch for a price of $780 per acre. In addition, the house was valued at $125,000 and the equipment amounted to $22,300.
    a. What was the total price of your purchase?

$65 \times 780 =$ 50,700 Land

125,000 House

22,300 Equipment

$198,000 Total price

    b. Since the owner was anxious to sell, he offered to finance the ranch for you with a no-interest mortgage loan. What would your monthly payments be to pay off the loan in 10 years?

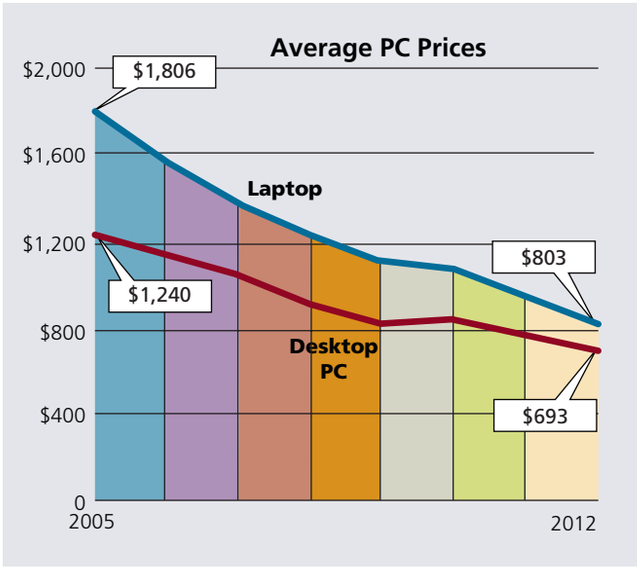
$\frac{198{,}000}{120} = \$1{,}650$ Monthly payment

    c. Besides the mortgage payment, you are required to make monthly property tax and insurance payments. If property tax is $3,000 per year and insurance is $2,400 per year, how much would these items add to your monthly expenses for the ranch?

$\frac{3{,}000 + 2{,}400}{12} = \$450$ Additional expense

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29. As the IT manager for FastNet Enterprises, you have maintained records of the average prices you've paid for PCs over the years, and you are reviewing your records over a particularly interesting period in your company's history. In 2005, you purchased 12 laptop computers and 15 desktop computers for your office staff. Using the graph Average PC Prices, answer the following:



a. What was the total amount of the purchase for these computers in 2005?

$$\begin{aligned} 12 \times 1{,}806 &= 21{,}672 \\ 15 \times 1{,}240 &= 18{,}600 \\ &\$40{,}272 \end{aligned}$$

b. In 2012, you replaced all of the computers with new ones. What was the total amount of the purchase for these computers?

$$\begin{aligned} 12 \times 803 &= 9{,}636 \\ 15 \times 693 &= 10{,}395 \\ &\$20{,}031 \end{aligned}$$

c. In total, how much did you save in 2012 over 2005 because of falling computer prices?

$$\begin{array}{r} 40{,}272 \\ -\ 20{,}031 \\ \$20{,}241 \end{array}$$

BUSINESS DECISION: ESTIMATING A TILE JOB

30. You are the owner of Decorama Flooring. Todd and Claudia have asked you to give them an estimate for tiling four rooms of their house. The living room is 15 feet × 23 feet, the dining room is 12 feet × 18 feet, the kitchen is 9 feet × 11 feet, and the study is 10 feet × 12 feet.

a. How many square feet of tile are required for each room? (Multiply the length by the width.)

Living Room	Dining Room	Kitchen	Study
23	18	11	12
× 15	× 12	× 9	× 10
345 sq ft	216 sq ft	99 sq ft	120 sq ft

b. What is the total number of square feet to be tiled?

$$\begin{array}{r} 345 \\ 216 \\ 99 \\ +\ 120 \\ 780 \text{ Total sq ft} \end{array}$$

c. If the tile for the kitchen and study costs $4 per square foot and the tile for the living and dining rooms costs $3 per square foot, what is the total cost of the tile?

99 Kitchen	345 Living room	876
+ 120 Study	+ 216 Dining room	+1,683
219 sq ft	561 sq ft	$2,559 Total cost of tile
× 4 Price	× 3 Price	
$876	$1,683	

d. If your company charges $2 per square foot for installation, what is the total cost of the tile job?

780 sq ft	1,560
× 2 Price	+ 2,559
$1,560 Installation charge	$4,119 Total cost of job

e. If Todd and Claudia have saved $4,500 for the tile job, by how much are they over or under the amount needed?

$$\begin{array}{r} 4{,}500 \text{ Saved} \\ -\ 4{,}119 \text{ Cost} \\ \$381 \text{ Over amount needed} \end{array}$$

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