MULTIPLICATION AND DIVISION OF WHOLE NUMBERS: DIVISION OF WHOLE NUMBERS*

Wade Ellis

Denny Burzynski

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Abstract

This module is from Fundamentals of Mathematics by Denny Burzynski and Wade Ellis, Jr. This module discusses how to divide whole numbers. By the end of the module students should be able to be able to divide a whole number by a single or multiple digit divisor and interpret a calculator statement that a division results in a remainder.

1 Section Overview

- Division with a Single Digit Divisor
- Division with a Multiple Digit Divisor
- Division with a Remainder
- Calculators

2 Division with a Single Digit Divisor

Our experience with multiplication of whole numbers allows us to perform such divisions as $75 \div 5$. We perform the division by performing the corresponding multiplication, $5 \times Q = 75$. Each division we considered in here¹ had a one-digit quotient. Now we will consider divisions in which the quotient may consist of two or more digits. For example, $75 \div 5$.

Let's examine the division $75 \div 5$. We are asked to determine how many 5's are contained in 75. We'll approach the problem in the following way.

- 1. Make an educated guess based on experience with multiplication.
- 2. Find how close the estimate is by multiplying the estimate by 5.
- 3. If the product obtained in step 2 is less than 75, find out how much less by subtracting it from 75.

< http://cnx.org/content/m34864/latest/>

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¹"Multiplication and Division of Whole Numbers: Concepts of Division of Whole Numbers"

4. If the product obtained in step 2 is greater than 75, decrease the estimate until the product is less than 75. Decreasing the estimate makes sense because we do not wish to exceed 75.

We can suggest from this discussion that the process of division consists of

The Four Steps in Division

- 1. an educated guess
- 2. a multiplication
- 3. a subtraction
- 4. bringing down the next digit (if necessary)

The educated guess can be made by determining how many times the divisor is contained in the dividend by using only one or two digits of the dividend.

2.1 Sample Set A

Example 1

Find $75 \div 5$.

 $5\overline{)75}$ Rewrite the problem using a division bracket.

10

 $5\overline{)75}$

Make an educated guess by noting that one 5 is contained in 75 at most 10 times. Since 7 is the tens digit, we estimate that 5 goes into 75 at most 10 times.

- $\begin{array}{r}10\\5\overline{)75}\\-\underline{50}\end{array}$
- 25

Now determine how close the estimate is. 10 fives is $10 \times 5 = 50$. Subtract 50 from 75.

Estimate the number of 5's in 25.

There are exactly 5 fives in 25.

5	$10 ext{ fives} + 5 ext{ fives} = 15 ext{ fives}.$
10	There are 15 fives contained in 75.
$5\overline{)75}$	
-50	
25	
-25	
0	
75	≟ 15×5
Check: 75	<i>≚</i> 75
Thus, 75 -	$\div 5 = 15.$
TT1	ion in this division can be shortened by whitin

The notation in this division can be shortened by writing.

 $\begin{array}{r} 15 \\ 5)75 \\ \hline -5 \downarrow \\ 25 \\ \hline -25 \\ \hline \end{array}$

0

Divide:	5 goes into 7 at most 1 time.	Divide:	5 goes into 25 exactly 5 times.
{ Multiply:	$1 \times 5 = 5$. Write 5 below 7.	{ Multiply:	$5 \times 5 = 25$. Write 25 below 25.
Subtract:	7 - 5 = 2. Bring down the 5.	Subtract:	25 - 25 $=$ $0.$

Example 2

Find $4,944 \div 8$.

8)4944

Rewrite the problem using a division bracket.

 $600 \\ 8\overline{)4944} \\ \underline{-4800}$

144

8 goes into 49 at most 6 times, and 9 is in the hundreds column. We'll guess 600. Then, $8 \times 600 = 4800$.

10 600

8	4944
ð)	4944

-4800

144

- 80

8 goes into 14 at most 1 time, and 4 is in the tens column. We'll guess 10.

8
10
600
$8\overline{)4944}$
-4800
144
- 80
64
-64
0

8 goes into 64 exactly 8 times.

3

600 eights + 10 eights + 8 eights = 618 eights.

4944 ≟ 8 × 618

Check: **4944 ∡ 4944**

Thus, $4,944 \div 8 = 618$.

As in the first problem, the notation in this division can be shortened by eliminating the subtraction signs and the zeros in each educated guess.

618	
8)4944	
48↓	
14	
8.	
64	
64	
0	

Divide:	8 goes into 49 at most 6 times.	Divide:	8 goes into 14 at most 1 time.	Divide:	8 goes into 6
{ Multiply:	$6 \times 8 = 48$. Write 48 below 49.	{ Multiply:	$1 \times 8 = 8$. Write 8 below 14.	{ Multiply:	$8 \times 8 = 64.$
Subtract:	49 - 48 = 1. Bring down the 4.	Subtract:	14 - 8 = 6. Bring down the 4.	Subtract:	64

NOTE: Not all divisions end in zero. We will examine such divisions in a subsequent subsection.

2.2 Practice Set A

Perform the following divisions.

Exercise 1 $126 \div 7$	(Solution on p. 15.)
Exercise 2 $324 \div 4$	(Solution on p. 15.)
Exercise 3 2,559 ÷ 3	(Solution on p. 15.)
Exercise 4 5, 645 ÷ 5	(Solution on p. 15.)
Exercise 5 $757, 125 \div 9$	(Solution on p. 15.)

3 Division with a Multiple Digit Divisor

The process of division also works when the divisor consists of two or more digits. We now make educated guesses using the first digit of the divisor and one or two digits of the dividend.

3.1 Sample Set B

Example 3

Find $2,232 \div 36$.

36)2232

Use the first digit of the divisor and the first two digits of the dividend to make the educated guess.

3 goes into 22 at most 7 times.

Try 7: $7 \times 36 = 252$ which is greater than 223. Reduce the estimate.

Try 6: $6 \times 36 = 216$ which is less than 223.

 $\begin{array}{c} 6 \\ 36) \hline 2232 \\ -216\downarrow \\ \hline 72 \\ \end{array} \qquad \text{Multiply:} \quad 6 \times 36 = 216. \text{ Write } 216 \text{ below } 223. \\ \text{Subtract:} \quad 223 - 216 = 7. \text{ Bring down the } 2. \end{array}$

Divide 3 into 7 to estimate the number of times 36 goes into 72. The 3 goes into 7 at most 2 times.

Try 2: $2 \times 36 = 72$. **62 36)2232 216 72 72 72 72 0 2232 \stackrel{?}{=} 36 \times 62** *Check***: 2232 \stackrel{?}{=} 232 \times 2232** Thus, 2, 232 $\div 36 = 62$.

Example 4

Find $2, 417, 228 \div 802$.

802)2417228

First, the educated guess: $24 \div 8 = 3$. Then $3 \times 802 = 2406$, which is less than 2417. Use 3 as the guess. Since $3 \times 802 = 2406$, and 2406 has four digits, place the 3 above the fourth digit of the dividend.

$$\begin{array}{r} 3 \\
 802 \overline{\smash{\big)} 2417228} \\
 \underline{-2406 \downarrow} \\
 112
 \end{array}$$

Subtract: 2417 - 2406 = 11.

Bring down the 2.

The divisor 802 goes into 112 at most 0 times. Use 0.



Perform the following divisions.

Exercise 6 1,376÷32 Exercise 7 6,160÷55 (Solution on p. 15.)

(Solution on p. 15.)

Exercise 8	(Solution on p. 15.)
$18,605 \div 61$	
Exercise 9	(Solution on p. 15.)
$144,768 \div 48$	

4 Division with a Remainder

We might wonder how many times 4 is contained in 10. Repeated subtraction yields

 $\begin{array}{r}10\\-4\\6\\-4\\2\end{array}$

Since the remainder is less than 4, we stop the subtraction. Thus, 4 goes into 10 two times with 2 remaining. We can write this as a division as follows.

 $2 \\ 4\overline{)10} \\ - 8 \\ 2$

Divide: 4 goes into 10 at most 2 times.

Multiply: $2 \times 4 = 8$. Write 8 below 0.

Subtract: 10 - 8 = 2.

Since 4 does not divide into 2 (the remainder is less than the divisor) and there are no digits to bring down to continue the process, we are done. We write

 $\begin{array}{c} 2R2\\ 4\overline{\smash{\big)}\ 10}\\ \underline{-8}\\ 2\end{array} \quad \text{or } 10 \div 4 = \underbrace{2R2}_{2 \text{ with remainder } 2}\end{array}$

4.1 Sample Set C

 $\frac{6\downarrow}{25}\\\frac{24}{1}$

{ Multiply: $2 \times 3 = 6$. Write 6 below 8. { Multiply: $3 \times 8 = 24$. Write 24 below 25. Subtract: $8 \cdot 6 = 2$. Bring down the 5. Subtract: $25 \cdot 24 = 1$. There are no more digits to bring down to continue the process. We are done. One is the remainder. Check: Multiply 28 and 3, then add 1. 28 $\times 3$ 84 ± 1 85 Thus, $85 \div 3 = 28R1$. Example 6 Find 726 ÷ 23. 31 36 23 37 36 23 37 37 69 36 23 37 37 4 23 36 23 37 37 36 23 37 37 37 36 23 37 37 36 23 37 37 36 23 37 37 37 36 23 37 37 36 23 37 37 36 23 37 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 23 37 36 37 37 36 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37 37	Divide:	3 goes into 8 at most 2 times.	Divide:	3 goes into	25 at most 8 tir	mes.
Subtract: $8 \cdot 6 = 2$. Bring down the 5. Subtract: $25 \cdot 24 = 1$. There are no more digits to bring down to continue the process. We are done. One is the remainder. Check: Multiply 28 and 3, then add 1. 28 $\times 3$ 84 ± 1 85 Thus, $85 + 3 = 28R1$. Example 6 Find 726 $\div 23$. $23\overline{)726}$ $69\overline{)}$ 36 $23\overline{)13}$ Check: Multiply 31 by 23, then add 13. $\times 23\overline{)93}$ 62 $7\overline{13}$ ± 13 $726 \div 23 = 31R13$. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) $75 \div 4$ Exercise 11 (Solution on p. 15.) $346 \div 8$	{ Multiply:	$2 \times 3 = 6$. Write 6 below 8.	{ Multiply:	3 imes 8 = 24.	Write 24 below	v 25.
remainder. Check: Multiply 28 and 3, then add 1. 28 $\times 3$ 84 ± 1 85 Thus, 85 $\div 3 = 28$ R1. Example 6 Find 726 $\div 23$. 23) 726 691 36 23 13 Check: Multiply 31 by 23, then add 13. 31 $\times 23$ 93 62 713 ± 13 726 Thus, 726 $\div 23 = 31R13$. 4.2 Practice Set C Perform the following divisions. Exercise 10 75 $\div 4$ Exercise 11 (Solution on p. 15.) 346 $\div 8$	Subtract: There are	8 - $6 = 2$. Bring down the 5. e no more digits to bring down	Subtract: to continue	25 the process.	5 - 24 = 1. We are done.	One is the
Check: Multiply 28 and 3, then add 1. 28 $\times \frac{3}{84}$ $\pm \frac{1}{1}$ 85 Thus, 85 $\pm 3 = 28$ R1. Example 6 Find 726 ± 23 . 23 31 23 31 23 31 23 31 23 31 23 31 Check: Multiply 31 by 23, then add 13. $\times \frac{23}{93}$ 62 713 $\pm \frac{13}{726}$ Thus, 726 $\pm 23 = 31R13$. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) 75 ± 4 (Solution on p. 15.) 346 ± 8	remainder.	0 0		-		
28 $\times \frac{3}{84}$ $\pm \frac{1}{1}$ $\frac{1}{85}$ Thus, 85 ÷ 3 = 28R1. Example 6 Find 726 ÷ 23. 23)726 $\frac{691}{36}$ $\frac{23}{13}$ Check: Multiply 31 by 23, then add 13. $\times \frac{23}{93}$ $\frac{62}{713}$ $\pm \frac{13}{726}$ Thus, 726 ÷ 23 = 31 <i>R</i> 13. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) 75 ÷ 4 (Solution on p. 15.) 346 ÷ 8 (Solution on p. 15.)	Check: M	[ultiply 28 and 3 , then add 1 .				
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Thus, $85 \div 3 = 28R1$. Example 6 Find 726 ÷ 23. 23)726 694 36 23 13 Check: Multiply 31 by 23, then add 13. $\begin{array}{r}31\\ \times 23\\ 93\\ 62\\ 713\\ + 13\\ 726\\ \end{array}$ Thus, $726 \div 23 = 31R13$. 4.2 Practice Set C Perform the following divisions. Exercise 10 75 ÷ 4 Exercise 11 346 ÷ 8 (Solution on p. 15.) 346 ÷ 8	85					
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Find 120 ± 23 . 23) $\overline{726}$ 69 36 23 13 Check: Multiply 31 by 23, then add 13. X 23 93 62 713 + 13 726 Thus, 726 \div 23 = 31 <i>R</i> 13. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) 75 \div 4 Exercise 11 (Solution on p. 15.) 346 \div 8	Example 6 Find 726 : f) 2				
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$\begin{array}{c} 30\\ 23\\ 13\\ \\ Check: Multiply 31 by 23, then add 13.\\ \\ \times 23\\ 93\\ 62\\ 713\\ + 13\\ 726\\ \\ Thus, 726 \div 23 = 31R13.\\ \end{array}$ $\begin{array}{c} 4.2 \ Practice \ Set \ C\\ Perform the following divisions.\\ \hline Exercise \ 10\\ 75 \div 4\\ \hline Exercise \ 11\\ 346 \div 8\\ \end{array} \qquad (Solution \ on \ p. \ 15.)\\ 346 \div 8\\ \end{array}$						
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $		2				
Check: Multiply 31 by 23, then add 13. $\begin{array}{r} 31 \\ \times 23 \\ 93 \\ 62 \\ \overline{713} \\ + 13 \\ \overline{726} \\ \end{array}$ Thus, 726 \div 23 = 31 <i>R</i> 13. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) 75 \div 4 Exercise 11 (Solution on p. 15.) 346 \div 8	<u>20</u> 10					
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$\begin{array}{c} \times & 23 \\ \hline 93 \\ 62 \\ \hline 713 \\ + & 13 \\ \hline 726 \\ \end{array}$ Thus, 726 \div 23 = 31 <i>R</i> 13. 4.2 Practice Set C Perform the following divisions. Exercise 10 (Solution on p. 15.) 75 \div 4 Exercise 11 (Solution on p. 15.) 346 \div 8	31					
$\begin{array}{c} \textbf{93} \\ \textbf{62} \\ \textbf{713} \\ \textbf{+13} \\ \textbf{726} \\ \textbf{Thus, 726 \div 23 = 31R13.} \end{array}$ $\begin{array}{c} \textbf{4.2 Practice Set C} \\ \textbf{Perform the following divisions.} \\ \textbf{Exercise 10} \\ \textbf{75 \div 4} \\ \textbf{Exercise 11} \\ \textbf{346 \div 8} \end{array} \tag{Solution on p. 15.)} \\ \textbf{346 \div 8} \end{array}$	$\frac{\times 23}{02}$					
$\begin{array}{r} & \begin{array}{r} & \begin{array}{r} & \begin{array}{r} & & \\ \hline \\ \hline$	93 62					
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4.2 Practice Set C Perform the following divisions. Exercise 10 $75 \div 4$ (Solution on p. 15.)Exercise 11 $346 \div 8$	Thus, 726	$5 \div 23 = 31R13.$				
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4.2 Practice Set C Perform the following divisions.Exercise 10 $75 \div 4$ Exercise 11 $346 \div 8$ (Solution on p. 15.)						
Perform the following divisions.(Solution on p. 15.) $75 \div 4$ (Solution on p. 15.) $246 \div 8$ (Solution on p. 15.)	4.2 Practice Set	t C				
Exercise 10 $75 \div 4$ (Solution on p. 15.)Exercise 11 $346 \div 8$ (Solution on p. 15.)	Perform the follow	wing divisions.				
Exercise 11 $346 \div 8$ (Solution on p. 15.)	$\begin{array}{c} \mathbf{Exercise} \ 10 \\ 75 \div 4 \end{array}$				(Solution	1 on p. 15.)
540 ± 6	Exercise 11				(Solution	n on p. 15.)
Exercise 12 (Solution on p. 15)	040 ± 0 Exercise 19				(Solution	10n n 15)

(Solution on p. 15.)

 $489 \div 21$

Exercise 13 $5,016 \div 82$

Exercise 14 $41,196 \div 67$

5 Calculators

The calculator can be useful for finding quotients with single and multiple digit divisors. If, however, the division should result in a remainder, the calculator is unable to provide us with the particular value of the remainder. Also, some calculators (most nonscientific) are unable to perform divisions in which one of the numbers has more than eight digits.

5.1 Sample Set D

Use a calculator to perform each division.

Example 7 $328 \div 8$

Type	328
Press	÷
Type	8
Press	=

Table 1

The display now reads 41.

Example 8 53, $136 \div 82$

Type	53136
Press	÷
Type	82
Press	



The display now reads 648.

Example 9

 $730,019,001 \div 326$

We first try to enter 730,019,001 but find that we can only enter 73001900. If our calculator has only an eight-digit display (as most nonscientific calculators do), we will be unable to use the calculator to perform this division.

Example 10

 $3727 \div 49$

(Solution on p. 15.)

9

3727
÷
49
=

Table 3

The display now reads 76.061224.

This number is an example of a decimal number (see here²). When a decimal number results in a calculator division, we can conclude that the division produces a remainder.

5.2 Practice Set D

Use a calculator to perform each division.

Exercise 15 3,330 ÷ 74	(Solution on p. 15.)
Exercise 16 63, 365 ÷ 115	(Solution on p. 15.)
Exercise 17 21,996,385,287÷53	(Solution on p. 15.)
Exercise 18 4,558 ÷ 67	(Solution on p. 15.)

6 Exercises

For the following problems, perform the divisions.

The first 38 problems can be checked with a calculator by multiplying the divisor and quotient then adding the remainder.

Exercise 19 $52 \div 4$	(Solution on p. 15.)
Exercise 20 776 ÷ 8	
Exercise 21 $603 \div 9$	(Solution on p. 15.)
Exercise 22 $240 \div 8$	
Exercise 23 $208 \div 4$	(Solution on p. 15.)
Exercise 24 $576 \div 6$	
Exercise 25 $21 \div 7$	(Solution on p. 15.)

²"Decimals: Objectives" http://cnx.org/content/m18894/latest/

Exercise 26 $0 \div 0$	
Exercise 27 $140 \div 2$	(Solution on p. 15.)
Exercise 28 528 ÷ 8	
Exercise 29 244 ÷ 4	(Solution on p. 15.)
Exercise 30 0 ÷ 7	
Exercise 31 177÷3	(Solution on p. 16.)
Exercise 32 96 ÷ 8	
Exercise 33 67÷1	(Solution on p. 16.)
Exercise 34 896 ÷ 56	
Exercise 35 $1,044 \div 12$	(Solution on p. 16.)
Exercise 36 988 ÷ 19	
Exercise 37 5,238 ÷ 97	(Solution on p. 16.)
Exercise 38 $2,530 \div 55$	
Exercise 39 4,264 ÷ 82	(Solution on p. 16.)
Exercise 40 $637 \div 13$	
Exercise 41 $3,420 \div 90$	(Solution on p. 16.)
Exercise 42 5,655 ÷ 87	
Exercise 43 2,115 ÷ 47	(Solution on p. 16.)
Exercise 44 9,328 ÷ 22	
Exercise 45 55,167 ÷ 71	(Solution on p. 16.)
Exercise 46 68, 356 ÷ 92	
Exercise 47 27, 702 ÷ 81	(Solution on p. 16.)

Exercise 48 $6,510 \div 31$	
Exercise 49 60, 536 ÷ 94	(Solution on p. 16.)
Exercise 50 31,844 ÷ 38	
Exercise 51 23,985 ÷ 45	(Solution on p. 16.)
Exercise 52 $60, 606 \div 74$	
Exercise 53 $2,975,400 \div 285$	(Solution on p. 16.)
Exercise 54 1, 389, 660 ÷ 795	
Exercise 55 $7,162,060 \div 879$	(Solution on p. 16.)
Exercise 56 7, 561, 060 ÷ 909	
Exercise 57 $38 \div 9$	(Solution on p. 16.)
Exercise 58 $97 \div 4$	
Exercise 59 $199 \div 3$	(Solution on p. 16.)
Exercise 60 $573 \div 6$	
Exercise 61 10,701 ÷ 13	(Solution on p. 16.)
Exercise 62 13,521 ÷ 53	
Exercise 63 3,628 ÷ 90	(Solution on p. 16.)
Exercise 64 10,592 ÷ 43	
Exercise 65 19,965 ÷ 30	(Solution on p. 16.)
Exercise 66 8,320 ÷ 21	
Exercise 67 61,282 ÷ 64	(Solution on p. 16.)
Exercise 68 $1,030 \div 28$	
Exercise 69 7,319 ÷ 11	(Solution on p. 16.)

Exercise 70 3,628 ÷ 90	
Exercise 71 35,279 ÷ 77	(Solution on p. 16.)
Exercise 72 52,196 ÷ 55	
Exercise 73 67,751 ÷ 68	(Solution on p. 16.)

For the following 5 problems, use a calculator to find the quotients.

Exercise 74 4,346 ÷ 53	
Exercise 75 3,234 ÷ 77	(Solution on p. 16.)
Exercise 76 6,771 ÷ 37	
Exercise 77 4,272,320 ÷ 520	(Solution on p. 16.)
Exercise 78	

 $7,558,110 \div 651$

Exercise 79

A mathematics instructor at a high school is paid \$17,775 for 9 months. How much money does this instructor make each month?

Exercise 80

A couple pays \$4,380 a year for a one-bedroom apartment. How much does this couple pay each month for this apartment?

Exercise 81

(Solution on p. 17.)

(Solution on p. 16.)

Thirty-six people invest a total of \$17,460 in a particular stock. If they each invested the same amount, how much did each person invest?

Exercise 82

Each of the 28 students in a mathematics class buys a textbook. If the bookstore sells \$644 worth of books, what is the price of each book?

Exercise 83

(Solution on p. 17.)

(Solution on p. 17.)

A certain brand of refrigerator has an automatic ice cube maker that makes 336 ice cubes in one day. If the ice machine makes ice cubes at a constant rate, how many ice cubes does it make each hour?

Exercise 84

A beer manufacturer bottles 52,380 ounces of beer each hour. If each bottle contains the same number of ounces of beer, and the manufacturer fills 4,365 bottles per hour, how many ounces of beer does each bottle contain?

Exercise 85

A computer program consists of 68,112 bits. 68,112 bits equals 8,514 bytes. How many bits in one byte?

Exercise 86

A 26-story building in San Francisco has a total of 416 offices. If each floor has the same number of offices, how many floors does this building have?

Exercise 87

(Solution on p. 17.)

A college has 67 classrooms and a total of 2,546 desks. How many desks are in each classroom if each classroom has the same number of desks?

6.1 Exercises for Review

Exercise 88

(here³) What is the value of 4 in the number 124,621? **Exercise 89** (Solution on p. 17.) (here⁴) Round 604,092 to the nearest hundred thousand. **Exercise 90** (here⁵) What whole number is the additive identity? **Exercise 91** (Solution on p. 17.) (here⁶) Find the product. $6,256 \times 100$. **Exercise 92**

(here⁷) Find the quotient. $0 \div 11$.

 $^{^3}$ "Addition and Subtraction of Whole Numbers: Whole Numbers" http://cnx.org/content/m34795/latest/ -

⁴"Addition and Subtraction of Whole Numbers: Rounding Whole Numbers" http://cnx.org/content/m34780/latest/>

^{5&}quot;Addition and Subtraction of Whole Numbers: Properties of Addition" http://cnx.org/content/m34802/latest/

⁶"Multiplication and Division of Whole Numbers: Multiplication of Whole Numbers"

 $<\! http://cnx.org/content/m34863/latest/>$

⁷"Multiplication and Division of Whole Numbers: Concepts of Division of Whole Numbers" http://cnx.org/content/m34864/latest/

Solutions to Exercises in this Module

Solution to Exercise 1 (p. 4) 18Solution to Exercise 2 (p. 4) 81 Solution to Exercise 3 (p. 4) 853Solution to Exercise 4 (p. 4) 1,129Solution to Exercise 5 (p. 4) 84,125Solution to Exercise 6 (p. 6) 43Solution to Exercise 7 (p. 6) 112Solution to Exercise 8 (p. 7) 305Solution to Exercise 9 (p. 7) 3.016Solution to Exercise 10 (p. 8) 18 R3Solution to Exercise 11 (p. 8) 43 R2Solution to Exercise 12 (p. 8) 23 R6Solution to Exercise 13 (p. 8) 61 R14 Solution to Exercise 14 (p. 9) 614 R58 Solution to Exercise 15 (p. 10) 45Solution to Exercise 16 (p. 10) 551Solution to Exercise 17 (p. 10) Since the dividend has more than eight digits, this division cannot be performed on most nonscientific calculators. On others, the answer is 415,026,137.4 Solution to Exercise 18 (p. 10) This division results in 68.02985075, a decimal number, and therefore, we cannot, at this time, find the value of the remainder. Later, we will discuss decimal numbers. Solution to Exercise 19 (p. 10) 13Solution to Exercise 21 (p. 10) 67Solution to Exercise 23 (p. 10) 52Solution to Exercise 25 (p. 10) Solution to Exercise 27 (p. 11)

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Solution to Exercise 29 (p. 11) 61Solution to Exercise 31 (p. 11) 59Solution to Exercise 33 (p. 11) 67Solution to Exercise 35 (p. 11) 87 Solution to Exercise 37 (p. 11) 54Solution to Exercise 39 (p. 11) 52Solution to Exercise 41 (p. 11) 38Solution to Exercise 43 (p. 11) 45Solution to Exercise 45 (p. 11) 777 Solution to Exercise 47 (p. 11) 342Solution to Exercise 49 (p. 12) 644Solution to Exercise 51 (p. 12) 533Solution to Exercise 53 (p. 12) 10.440Solution to Exercise 55 (p. 12) 8,147 remainder 847 Solution to Exercise 57 (p. 12) 4 remainder 2 Solution to Exercise 59 (p. 12) 66 remainder 1 Solution to Exercise 61 (p. 12) 823 remainder 2 Solution to Exercise 63 (p. 12) 40 remainder 28Solution to Exercise 65 (p. 12) 665 remainder 15 Solution to Exercise 67 (p. 12) 957 remainder 34 Solution to Exercise 69 (p. 12) 665 remainder 4 Solution to Exercise 71 (p. 13) 458 remainder 13 Solution to Exercise 73 (p. 13) 996 remainder 23 Solution to Exercise 75 (p. 13) 42Solution to Exercise 77 (p. 13) 8,216

Connexions module: m34865

Solution to Exercise 79 (p. 13) \$1,975 per month Solution to Exercise 81 (p. 13) \$485 each person invested Solution to Exercise 83 (p. 13) 14 cubes per hour Solution to Exercise 85 (p. 13) 8 bits in each byte Solution to Exercise 87 (p. 14) 38 Solution to Exercise 89 (p. 14) 600,000 Solution to Exercise 91 (p. 14) 625,600