4 •1 Uses of Divisio	n
-----------------------------	---

Use multiplication and division facts to solve the following problems mentally. *Remember:* Break the number into two or more friendly parts.

Example: How many 4s in 71?

Name

Break 71 into smaller, friendly numbers. Here are two ways.

- 40 and 31. Ask yourself: How many 4s in 40? (10) How many 4s in 31? (7 and 3 left over) Think: What multiplication fact for 4 has a product near 31? (4 * 7 = 28) Total = 17 and 3 left over.
- 20, 20, 20, and 11. Ask yourself: How many 4s in 20? (5) How many 4s in three 20s?
 (15) How many 4s in 11? (2 and 3 left over) Total = 17 and 3 left over.

So 71 divided by 4 equals 17 with 3 left over.

 1. 57 divided by 3 equals ______.
 2. 96 divided by 8 equals ______

(friendly parts for 57)

- **3.** The diameter of Earth, about 8,000 miles, is about 4 times the diameter of the moon. What is the approximate diameter of the moon?
 - 8,000 mi

4. The weight of an object on Earth is 6 times heavier than its weight on the moon. An object that weighs 30 lb on Earth weighs how many pounds on the moon?

(friendly parts for 96)







Testing for Divisibility by 7, 11, and 13

Use these divisibility rules to test large numbers.

To test if a number is divisible by 7:

 Take the rightmost digit. 	25,80 <u>9</u>		
 Double it. 	9 * 2 = 18		
 Subtract the result from the remaining digits. 	2,580 - 18 = 2,562		
 Repeat, each time doubling the rightmost digit and subtracting, uptil the result is small enough 	2,562 $2 * 2 = 4$ $256 - 4 = 252$ 252 $2 * 2 = 4$ $25 - 4 = 21$		
to know that it is, or is not, divisible by 7.	21 is divisible by 7, so 25,809 is divisible by 7.		

1. Is 33,992 divisible by 7? _____

To test if a number is divisible by 11:

 Find the sum of every other digit. 	<u>10,648</u> 1 + 6 + 8 = 15
• Find the sum of the digits that are left.	0 + 4 = 4
 Subtract. 	15 - 4 = 11 11 is divisible by 11, so 10,648 is divisible by 11.

2. Is 9,723 divisible by 11? _____

To test if a number is divisible by 13:

• M	ultiply the rightmost digit by 4.	1,166,93 <u>2</u>	2 * 4 = 8
 Ac dig 	dd the result to the remaining gits.	116,693 + 8 = 116,701	
♦ Re	epeat, each time multiplying	116,70 <u>1</u>	1 * 4 = 4
th	e rightmost digit and adding,	11,670 + 4 = 11,674	4 * 4 = 16
ur	ntil the result is small enough to	1,167 + 16 = 1,18 <u>3</u>	3 * 4 = 12
kn	know that it is, or is not, divisible	118 + 12 = 130	
by	/ 13.	130 = 13 * 10, so 1,166,923	is divisible by 13.

3. Is 89,362 divisible by 13? _____



Date Division Here is the partial-quotients algorithm using a friendly numbers strategy. 7237 Rename dividend (use multiples of the divisor):

naindar	Quationt	A nowary 22 DC
1	1	
6	33	Add the partial quotients: $30 + 3 = 33$
21	_3	How many 7s are in 27? 3 The second partial quotient. $3 * 7 = 21$ Subtract. 6 is left to divide.
<u>-210</u> 27	30	How many 7s are in 210? 30 The first partial quotient. $30 * 7 = 210$ Subtract. 27 is left to divide.
1)201		237 = 210 + 21 + 6

Remainder Quotient Answer: 33 R6

1. Another way to rename 237 with multiples of 7 is

237 = 70 + 70 + 70 + 21 + 6

If the example had used this name for 237, what would the partial quotients have been?

2.	6)166	3.	214 / 5
	Answer:		Answer:
4.	485 ÷ 15	5.	17)408
	Answer:		Answer:
	Practice		
6 .	Practice 3,817 + 168 =		
6.	Practice 3,817 + 168 = Check:		=
6.	Practice 3,817 + 168 = Check: 52 517 - 281 =		=
6. 7.	Practice 3,817 + 168 = Check: 52,517 - 281 =		=

STUDY LINK

Time



Divisibility by the Digits

Ms. Winters asked Vito and Jacob to make answer cards for a division puzzle. They had to find numbers that met all of the following characteristics.

	Example:
The first digit is divisible by 1.	1
The first two digits are divisible by 2.	12
The first three digits are divisible by 3.	120
The first four digits are divisible by 4.	1,204
 The first five digits are divisible by 5. 	12,040
 The first six digits are divisible by 6. 	120,402
The first seven digits are divisible by 7.	1,204,021
 The first eight digits are divisible by 8. 	12,049,216
 The first nine digits are divisible by 9. 	120,402,162

1. Jacob knew that with divisibility rules, it should be easy. The boys started with 3-digit numbers and found 123 and 242. Latoya checked their work. What should she tell them?

2. Use the characteristics listed above to find as many puzzle numbers as you can. Record them in the boxes below.

Puzzle Numbers					
4-digit	5-digit	6-digit	7-digit	8-digit	9-digit

Date

Time

STUDY LINK **Distance to School**

There are two ways to go from Josephina's house to school. She can take Elm Street and then Washington Avenue. She can also take Snakey Lane.

Use the map and scale below to answer the questions.

house **1.** Josephina started walking from home to school along Elm Street. a. How far would Josephina walk before she turned onto Washington Avenue? **b.** How far would she be from school when she turned the corner? 2. Suppose Josephina could take a straight path from her house to school. Estimate the distance. a. Draw and measure a straight line on the map from Josephina's house to the school. **b.** Use the scale to measure this distance in miles. Practice **3.** 376 - 188 = _____ Check: _____ + ____ = ____ **4.** 3,997 + 151 = _____ Check: _____ - ____ = Number Sense 1.0





0







Estimating Curved-Path Distances

Use a ruler, string, compass, paper and pencil, or any other tool.

 The map below shows the border between Mexico and the United States. Estimate the length of the border. _____ mi



2. a. Estimate the lengths of the following rivers. Use the map on pages 386 and 387 of the *Student Reference Book.*

River	Length (miles)
Arkansas (CO, KS, OK, and AR)	
Missouri (MT, ND, SD, NE, IA, KS, and MO)	
Brazos (NM and TX)	
Chattahoochee (GA, AL, FL)	

b. Explain how you found the length of the Chattahoochee River.

A Trip through the Panama Canal

The Panama Canal crosses the country of Panama near its capital city, Panama City. The canal connects the Atlantic Ocean and the Pacific Ocean.

Pretend that you will travel by ship from New York, through the Panama Canal, to Los Angeles.

- **1.** Use the map below to decide on a route your ship will take. Then use a pencil to draw this route on the map.
- **2.** Estimate the length of the route you have chosen. Use a ruler, string, compass, paper and pencil, or any other tool. _____ mi
- **3.** How much longer is your route than the straight-line distance from New York to Los Angeles?





mi

Time

LESSON



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Easy Multiples

1,000 * =	1,000 * =
100 * =	100 * =
50 * =	50 * =
20 * =	20 * =
10 * =	10 * =
5 * =	5 * =
1,000 * =	1,000 * =
100 * =	100 * =
50 * =	50 * =
20 * =	20 * =
10 * =	10 * =
5 * =	5 * =
1,000 * =	1,000 * =
100 * =	100 * =
50 * =	50 * =
20 * =	20 * =
10 * =	10 * =
5 * =	5 * =

Date



\Box	Practice
6.	2,746 + 68 =
	Check: =
7.	3,461 - 165 =
	Check: + =



Division Practice

For each division problem, complete the list of multiples of the divisor. Then divide.





Using Expanded Notation

- Work with a partner. Use a deck with 4 each of cards 1–9.
- Take turns dealing 4 cards and forming a 4-digit number.
- Write the number in standard notation and expanded notation.
- Then write equivalent names for the value of each digit.
- 1. Write a 4-digit number.
- 2. Write the number in expanded notation.

_____+ _____+ _____+ _____

Date

3. Write equivalent names for the value of each digit.

1st digit	2nd digit	3rd digit	4ւհ digit

- 4. Write a 4-digit number.
- **5.** Write the number in expanded notation.

6. Write equivalent names for the value of each digit.

1st digit	2nd digit	3rd digit	4th digit

+ + +



LESSON





Estimate and Calculate Quotients

For each problem:

- Make a magnitude estimate of the quotient. Ask yourself: Is the answer in the tenths, ones, tens, or hundreds?
- Circle a box to show the magnitude of your estimate.
- Write a number sentence to show how you estimated.
- If there is a decimal point, ignore it. Divide the numbers.
- Use your magnitude estimate to place the decimal point in the final answer.
- Check that your final answer is reasonable.

1.	. 6)78.6					3)387			
	0.1s	1s	10s	100s		0.1s	1s	10s	100s
3.	How I estimated: Answer:				4.	How I est Answer: _ 989 ÷ 43			
	0.1s	1s	10s	100s		0.1s	1s	10s	100s
	How I estimated:					How I estimated:			
5.	845 / 5				6.	15.84 / 9			
	0.1s	1s	10s	100s		0.1s	1s	10s	100s
	How I estimated:					How I est Answer:	imated: _		
	Practice								
7.	8.54 + 6.	004 =							
Ch	eck:					=	=		



. . . .

◆ First use □	II. to represent	the dividend wi	th base-10 blocl	KS.
◆ Then use □] I.to show ho	w you would dis	tribute the block	s in equal gro
to represent	t the division.			
 Record you 	r answer with dig	jits.		
Example: 5)689			1
	□ III ::	□ ::	□ ::	□
Answer: 5	137 R4)689			
1. 3)427				
 Show th 	e dividend:			
Show ed	qual groups below	<i>N</i> .		
 Write the 	e answer. 3)42	7		
2. 4)555				
Show th	e dividend:			
 Show ed 	qual groups below	W.		
 Write the 	e answer. 4/55	5		



For each problem:

Name

- ٠
- oups





A Division Challenge



Judy and two friends bought a raffle ticket at the school fund-raiser. They agreed that if they won, they would share the winnings equally. They won \$145! They received one \$100 bill, four \$10 bills, and five \$1 bills. Judy used this division algorithm to calculate how much money each person should get. Can you figure out how the algorithm works?

(*Hint:* There were 3 people in all. Judy realized that in order to share the \$100 bill, they needed to trade it for ten \$10 bills. Then they would have fourteen \$10 bills and five \$1 bills.)

	/ 00s	/ Os 4	/s 8 •	/Oths 3	/00ths 3
3	X	У	T	Ø	Ø
	-	14	25	10	10
		- <u>/2</u>	- <u>24</u>	<u>_9</u>	<u>-9</u>
		2	X	X	/

1. Explain how you think the algorithm works.



of this page. Then divide to solve the problem. Decide what the remainder. Explain what you did.	to do about
Example: You need to set up benches for a picnic. Each bench seats 7 people. You expect 25 people to attend. How many benches do you need? $\frac{25 \div 7 = b}{\text{Circle what you did with the remainder.}}$	How many benches? 7 seats per bench 7 7 7 7 7 25 people 4 4 benches
Ignored it Reported it as a fraction or decimal Round	ed the answer up
Why? 3 benches seat 21 people. One mo	ore bench is needed.
 It costs \$50.00 to be a member of a soccer team. The teaplays 8 games during the season. What is the cost per gate circle what you did with the remainder. Ignored it Reported it as a fraction or decimal Row Why?	am ame? \$ ounded the answer up
 2. Lynn is having a party. Pizzas cost \$8.00 each. How many pizzas can she buy with \$60.00? Circle what you did with the remainder. Ignored it Reported it as a fraction or decimal Row Why?	pizzas unded the answer up
Practice	
3. $31 \div 2 \rightarrow$ 4. $629 \ast 84 =$	

Ex

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4+6

STUDY LINK Division Number Stories with Remainders

For each number story draw a picture or write a number sentence on the back

Date



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LESSON

Finding Number Story Information

For each problem, write the number of the sentence that has the information for each part of the situation diagram. Then complete the situation diagram.

Problem 1

- **1.** Ms. Haag is rearranging her classroom.
- 2. There are 32 students.
- **3.** The students sit at tables.
- 4. Four students can sit at each table.
- 5. How many tables does she need?

Sentence(s): _____

tables		total students
?	4	

Problem 2

- 1. Marc needs 3 yards of fabric to make a cape for a costume party.
- 2. His friends want capes that match his.
- 3. If Marc has 15 yards of fabric, how many capes can he make?

Sentence(s): _____

 	in all



Date

Math Message	Math Message
Name:	Name:
1st die	1st die
2nd die	2nd die
Product (<i>P</i>)	Product (<i>P</i>)
20 * <i>P</i> =	20 * <i>P</i> =
Math Message	Math Message
Name:	Name:
1st die	1st die
2nd die	2nd die
Product (<i>P</i>)	Product (<i>P</i>)
20 * <i>P</i> =	20 * <i>P</i> =
Math Message	Math Message
Name:	Name:
1st die	1st die
2nd die	2nd die
Product (<i>P</i>)	Product (<i>P</i>)
20 * <i>P</i>	20 * <i>P</i> =

Time

STUDY LINK Variables For Problems 1–3: • Find the value of x in the first number sentence. Use this value to complete the second number sentence. **2.** $x = \frac{1}{10}$ of 100 **1.** x = number of days in a week $x^2 =$ _____ *x* * 78 = _____ **3.** x = largest sum possible with 2 six-sided dice 598 + x =_____ **4.** Count the number of letters in your first name and in your last name. a. My first name has ______ letters. b. My last name has ______ letters. **c.** Find the product of these 2 numbers. Product = _____ Answer the questions in Problems 5–11 by replacing x with the product you found in Problem 4. 5. Is *x* a prime or a composite number? _____ **6.** Is $\frac{x}{30}$ less than 1? _____ **7.** Which is larger, 3 * *x*, or *x* + 100? 8. What is the median and the range for this set of 3 weights: 30 pounds, 52 pounds, x pounds? 9. There are 200 students at Henry Clissold School. x% speak Spanish. How many students speak Spanish? _____ **10.** (3x + 5) - 7 =_____ **11.** True or false: $x^2 > 30 * x$ _____ Practice **12.** 3,817 + 168 = _____ **13.** 52,517 - 281 = ____

LESSON

Solving for Unknown Quantities

Date

For each number story:

- Draw a situation diagram.
- Fill in the numbers. Write a ? for the unknown quantity.
- ◆ Write a number sentence with └── for the unknown.
- Solve the problem.

Example:

Fran bought a bag of 14 marbles from a game store. She added them to her collection. She now has 47 marbles. How many marbles did she have before she bought more?

Number sentence: $\underline{/4 + \Box} = 47$

Solution: = 33

1. It was 68° when Nadine left for school. By lunchtime, it was

75°. By how many degrees had the temperature gone up?

Number sentence:

2. Michael wants to buy a milkshake. With tax, it costs \$3.92, and he has \$3.43. How much more money does he need?

Solution:

Number sentence: _____

Solution: _____

3. Lora bought 5 packages of pencils. Each package had 12 pencils in it. How many pencils did she buy in all?

Number sentence:

Solution: _____

4. Make up a problem of your own on the back of this page.











Unit 5: Family Letter



Fractions, Decimals, and Percents

Unit 5 focuses on naming numbers as fractions, decimals, and percents. Your child will use pattern blocks to review basic fraction and mixed-number concepts as well as notations. Your child will also formulate rules for finding equivalent fractions.

In *Fourth Grade Everyday Mathematics,* your child learned to convert easy fractions, such as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{10}$, and $\frac{3}{4}$, to equivalent decimals and percents. For example, $\frac{1}{2}$ can be renamed as 0.5 or 50%. Your child will now learn (with the use of a calculator) how to rename any fraction as a decimal and as a percent.

Unit 5 also introduces two new games: *Estimation Squeeze*, to practice estimating products; and *Frac-Tac-Toe*, to practice converting fractions to decimals and percents. These games, like others introduced earlier, are used to reinforce arithmetic skills. Both games use simple materials (calculator, number cards, and pennies or other counters) so you can play them at home.

Your child will study data about the past and compare it with current information as the American Tour continues.

Please keep this Family Letter for reference as your child works through Unit 5.



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Vocabulary

Important terms in Unit 5:

bar graph A graph that uses horizontal or vertical bars to represent data.

circle graph A graph in which a circle and its interior are divided through its center into parts to show the parts of a set of data. The whole circle represents the whole set of data.

denominator The number below the line in a fraction. In a fraction representing a whole, or ONE, divided into equal parts, the denominator is the total number of equal parts. In the fraction $\frac{a}{b}$, *b* is the denominator.

equivalent fractions Fractions that have different denominators but name the same amount. For example, $\frac{1}{2}$ and $\frac{4}{8}$ are equivalent fractions.

improper fraction A fraction whose numerator is greater than or equal to its denominator. For example, $\frac{4}{3}$, $\frac{5}{2}$, $\frac{4}{4}$, and $\frac{24}{12}$ are improper fractions. In *Everyday Mathematics*, improper fractions are sometimes called "top-heavy" fractions.

mixed number A number that is written using both a whole number and a fraction. For example, $2\frac{1}{4}$ is a mixed number equal to $2 + \frac{1}{4}$.

numerator The number above the line in a fraction. In a fraction representing a whole, or ONE, divided into equal parts, the numerator is the number of equal parts that are being considered. In the fraction $\frac{a}{b}$, *a* is the numerator.

percent (%) Per hundred, or out of a hundred. For example, 48% of the students in the school are boys means that, on average, 48 out of every 100 students in the school are boys.

Percent Circle A tool on the Geometry Template that is used to measure or draw figures that involve percents, such as *circle graphs*.



repeating decimal A decimal in which one digit or a group of digits is repeated without end. For example, 0.333... and 0.147 are repeating decimals.



Do-Anytime Activities

To work with your child on the concepts taught in this unit and in previous units, try these interesting and rewarding activities.

- 1. Help your child find fractions, decimals, and percents in the everyday world—in newspaper advertisements, on measuring tools, in recipes, in the sports section of the newspaper, and so on.
- **2.** Over a period of time, have your child record daily temperatures in the morning and in the evening. Keep track of the temperatures in a chart. Then have your child make a graph from the data. Ask questions about the data. For example, have your child find the differences in temperatures from morning to evening or from one day to the next.
- **3.** Practice using percents in the context of tips. For example, have your child calculate $\frac{1}{10}$ or 10% of amounts of money. Invite your child to find the tip the next time the family goes out for dinner.
- 4. Ask your child to identify 2-dimensional and 3-dimensional shapes around the house.

Building Skills through Games

In Unit 5, your child will practice operations and computation skills by playing the following games. For detailed instructions, see the *Student Reference Book*.

Estimation Squeeze See Student Reference Book, page 304.

This is a game for two players who use a single calculator. The game provides practice in estimating products.

Frac-Tac-Toe See Student Reference Book, pages 309–311.

This is a game for two players. Game materials include 4 each of the number cards 0–10, pennies or counters of two colors, a calculator, and a gameboard. The gameboard is a 5-by-5 number grid that resembles a bingo card. Several versions of the gameboard are shown in the *Student Reference Book*. *Frac-Tac-Toe* helps students practice converting fractions to decimals and percents.

Fraction Of See Student Reference Book, pages 313 and 314.

This is a game for two players. Game materials include 1 deck each of *Fraction Of* Fraction Cards and Set Cards, the *Fraction Of* Gameboard, and a record sheet. This game provides practice with multiplication of fractions and whole numbers.

Fraction/Percent Concentration See Student Reference Book, page 315.

This game helps students memorize some of the easy fraction/percent equivalencies. Two or three players use 1 set of *Fraction/Percent Concentration* tiles and a calculator to play.

Fraction Top-It See Student Reference Book, page 316.

This game is for 2–4 players. Game materials include 1 deck of 32 Fraction Cards. This game provides practice with comparing fractions.



As You Help Your Child with Homework

As your child brings assignments home, you might want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through this unit's Study Links.

Study Link 5+1

1. 92. 143. $\frac{16}{20}$, or $\frac{4}{5}$ 4. $\frac{45}{50}$, or $\frac{9}{10}$ 5. 706. 167. 98. a. \$9b. \$20c. Jen paid $\frac{2}{5}$ of the bill: $8 \div 2 = 4$. So that means each fifth of the total was \$4. Then $\frac{3}{5}$ must be \$12. And \$12 + \$8 = \$20.9. 1410. 14011. 1412. 140

Study Link 5+2

1.	$2\frac{1}{2}; \frac{5}{2}$		2.	$2\frac{4}{6}$, or $2\frac{2}{3}$;	$\frac{16}{6}$, or $\frac{8}{3}$
3.	$1\frac{2}{3};\frac{5}{3}$		4.	$2\frac{1}{6}; \frac{13}{6}$	5. $2\frac{5}{6}; \frac{17}{6}$
7.	262	8.	32 R4	9. 123	10. 72 R3

Study Link 5+3

1.	4	2.	12	3.	1; 4
4.	$\frac{4}{4} = 1$	5.	$\frac{6}{8} = \frac{3}{4}$	6.	$\frac{5}{4} = 1\frac{1}{4}$
7.	$\frac{9}{8}$, or $1\frac{1}{8}$ cups	9.	297		
10.	148 R3	11.	74 R3	12.	37 R3

Study Link 5+4

1.	=	2.	\neq	3.	\neq	4.	=	5. =
6.	=	7.	=	8.	=	9.	6	10. 21
11.	4	12.	40	13.	12	14.	80	15. 27
16.	56	17.	150	18.	70	19.	\$7.0	4
20.	\$20.	03	2	1. 17	7 R10		22.	80 R4

Study Link 5+5

2. 0.4; 1.9; 20.7; 24.0; 60.9; 160.6; 181.3; 297.9; 316.0

Study Link 5+6

1. $7\frac{79}{100}$; $7\frac{78}{100}$, or $7\frac{39}{50}$; $6\frac{21}{100}$; $4\frac{7}{10}$; $3\frac{6}{10}$, or $3\frac{3}{5}$ **2. a.** $\frac{15}{45}$, or $\frac{1}{3}$ **b.** $\frac{9}{45}$, or $\frac{1}{5}$ **c.** $\frac{3}{45}$, or $\frac{1}{15}$ **3.** $0.\overline{3}$; 0.2; $0.0\overline{6}$ **4.** 714 R6 **5.** 8 R4 **6.** 67 R5

Study Link 5+7

Sample answers given for Problem 1–5.

1.	0.25; 0).5; 0	.75	2.	2.25; 2	2.5; 2.	75
3.	0.65; ().7; 0	.775	4.	0.325;	0.35;	0.375
5.	0.051;	0.05	5; 0.059	6.	0.53		
7.	0.2	8.	0.77	9.	0.8	10.	0.051
11.	0.043;	0.05	; 0.1; 0.1	2; 0.2	; 0.6; 0	.78	
12.	\$7.06	13.	6 R17	14.	81	15.	694 R3

Study Link 5+8

1.
$$\frac{3}{4} = 0.75 = 75\%$$
; $\frac{14}{16} = 0.875 = 88\%$;
 $\frac{15}{25} = 0.6 = 60\%$; $\frac{17}{20} = 0.85 = 85\%$;
 $\frac{3}{8} = 0.375 = 38\%$
3. $\frac{3}{8}$; $\frac{15}{25}$; $\frac{3}{4}$; $\frac{17}{20}$; $\frac{14}{16}$ **4.** \$130 **5.** 10 questions
6. 97 R5 **7.** 48 R15 **8.** 32 R15 **9.** 24 R15

Study Link 5+9

- 2. Bar graph
- **3.** Line graph; Temperature went up and down.

Study Link 5+10

- **1. a.** 50% **b.** 15% **c.** 35%
- 25% of the students in my class have skateboards. 25% have in-line skates. 50% have bicycles.
- **4.** 633 **5.** 1.1636 **6.** 10 R1 **7.** 100 R4

Study Link 5+11

Check your child's circle graph.

2. 17 **3.** 23 **4.** 9 **5.** 7

Study Link 5+12

4. 3

- **1.** Mona ate 1 more cookie than Tomas. $\frac{3}{8}$ of 24 is 9; but $\frac{2}{5}$ of 25 is 10.
- **2.** 12 students were sick. If $\frac{2}{3}$ is 24, that means $\frac{1}{3}$ is 12 students. So that means the rest of the class, or $\frac{1}{3}$ of the class, or 12 students, is sick.
 - **5.** 24 **6.** 22 **7.** 24