

1-7 Enrichment**The Hidden Animal**

elearning day

Graph the following sets of points. Join successive points by a line segment. Begin a new line segment with each numbered set of ordered pairs. When you finish, you will have a picture of an animal.

11-8-19

1. $(10, 12), (8, 12), (2, 11\frac{1}{2}), (\frac{1}{2}, 10),$
 $(\frac{1}{2}, 5)$

2. $(\frac{1}{2}, 8), (1, 6\frac{1}{2}), (1, 5\frac{1}{2}), (1\frac{1}{2}, 3),$
 $(1\frac{1}{2}, 1), (4, 1), (3\frac{1}{2}, 2), (3\frac{1}{2}, 5\frac{1}{2})$

3. $(8\frac{1}{2}, 6\frac{1}{2}), (8, 6), (8\frac{1}{2}, 4), (8\frac{1}{2}, 1),$
 $(10\frac{1}{2}, 1), (10, 2), (10, 6)$

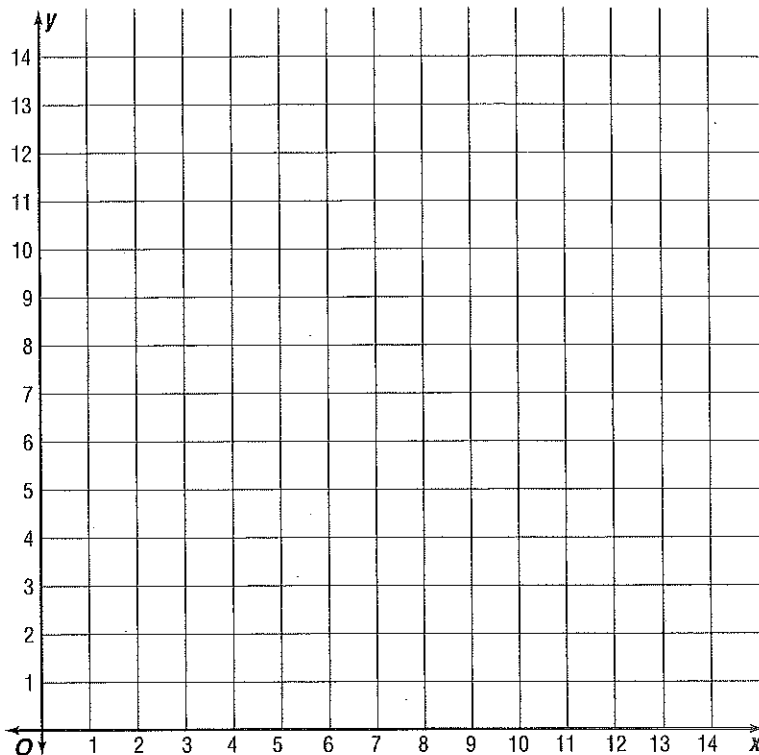
4. $(10, 5), (12, 3), (12, 1\frac{1}{2}), (10\frac{1}{2}, 1\frac{1}{2}),$
 $(10\frac{1}{2}, 2\frac{1}{2}), (10, 3)$

5. $(8, 6), (6, 5\frac{1}{2}), (3, 5\frac{1}{2}), (3, 2), (3\frac{1}{2}, 1)$

6. $(12, 12), (11, 12\frac{1}{2}), (9, 11\frac{1}{2}), (8\frac{1}{2}, 10\frac{1}{2}), (8\frac{1}{2}, 9\frac{1}{2}), (9, 8\frac{1}{2}), (10, 8),$
 $(11, 9)$

7. $(12, 12), (13, 12), (14, 11), (14, 9), (13\frac{1}{2}, 8), (13\frac{1}{2}, 7), (13, 3),$
 $(12\frac{1}{2}, 2), (12, 2\frac{1}{2}), (12\frac{1}{2}, 3), (12\frac{1}{2}, 6), (12, 7), (11, 7\frac{1}{2}), (10\frac{1}{2}, 7),$
 $(10, 6)$

8. Suppose you multiply both coordinates of each ordered pair by 2 and graph the resulting pairs on graph paper using the same scale on the axes as for the drawing above. How would the drawings compare?



1-8 Enrichment

Mental Math: Compensation

To add or subtract in your head, work with multiples of 10 (20, 30, 40, ...) or 100 (200, 300, 400, ...) and then adjust your answer.

To add 52, first add 50, then add 2 more.

To subtract 74, first subtract 70, then subtract 4 more.

To subtract 38, first subtract 40, then add 2.

To add 296, first add 300, then subtract 4.

Write the second step you would use to do each of the following.

1. Add 83.

1) Add 80.

2) _____

2. Add 304.

1) Add 300.

2) _____

3. Subtract 62.

1) Subtract 60.

2) _____

4. Add 27.

1) Add 30.

2) _____

5. Subtract 79.

1) Subtract 80.

2) _____

6. Subtract 103.

1) Subtract 100.

2) _____

7. Add 499.

1) Add 500.

2) _____

8. Add 294.

1) Add 300.

2) _____

9. Subtract 590.

1) Subtract 600.

2) _____

Use the method above to add 59 to each of the following.

10. 40

11. 72

12. 53

13. 15

Use the method above to subtract 18 from each of the following.

14. 96

15. 45

16. 71

17. 67



1-10 Enrichment

Histograms

Day 2

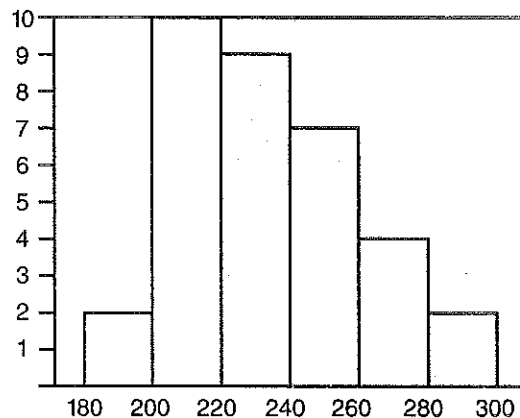
A histogram is a type of bar graph that displays the frequencies in a distribution of data that has been divided into equal intervals. Notice that there is no space between the bars. (A boundary grade, like 200 or 240, is included in the lower interval. 200 would be included in the 180-200 interval.)

Example: Weight of the players on the Mather Jr. High football team

Weight	Frequency
180-200	2
200-220	10
220-240	9
240-260	7
260-280	4
280-300	2

Use the graph to answer each of the following.

1. Give the histogram a name.
2. What does the vertical scale represent?
3. What does the horizontal scale represent?
4. How many weigh between 220 and 240?
5. How many players are there on the team?
6. How many weigh over 240 lb?
7. How many weigh 227 lb?



Make a histogram using the given data.

8. Grades in Mr. Miner's Math Class

Grade	Frequency
90-100	4
80-90	8
70-80	17
60-70	5
0-60	2

9. Grades in Mrs. Colburn's Math Class

Grade	Frequency
90-100	6
80-90	10
70-80	14
60-70	8
0-60	3

10. How many students in each class received a grade above 70?
11. How many students in each class had a grade of 60 or below?

2

2-8 Enrichment

Cross-Number Puzzle

Student Edition
Pages 104-108

Use the clues below to complete the following cross-number puzzle. Any negative signs should be placed in the same box as the first digit of the integer.

Across

1. $23 \times (-54)$

5. $-56 - 15$

7. $-4283 + 7316$

8. $46.8 \div (-1.3)$

10. $-3840 \div (-96)$

11. $-1.6 \times (-2785)$

12. $91.5 + (-11.5)$

13. $-42 - 679$

15. $50 \times (-0.48)$

18. $-53,000 \times (-0.001)$

23. $10 \times (-13) \times (-19)$

27. $-38.56 \div (-0.004)$

Down

1. $-718 + 584$

4. $-118 \div (-0.5)$

8. $-6.46 \div 0.17$

14. $-832 \times (-28)$

17. $-79 \times 3 \times 3$

22. $46 - (-52)$

19. -181×5

25. $26.1 \div (-0.45)$

28. $-38 - (-54)$

2. $-0.8 \times (-255)$

5. $-2 \times (-22) \times (-17)$

9. $1547 + (-939)$

15. $-40 \times (-20) \times (-25)$

19. $-13,406 + 3661$

24. $-10 \times (-46)$

21. $-42 + 61$

26. $-750 \times (-0.024)$

29. $11,260 + (-5210)$

3. $198 - (-237)$

6. $-1000 \div (-100)$

13. -5000×0.015

16. $-9 \times (-5)$

20. $-649 + 1535$

25. $-0.663 \div 0.013$

			1	2	3	4			
5	6		7					8	9
10			11					12	
		13	14			15	16		
17		18			19				20
21	22		23	24				25	
26			27					28	
			29						

2

3-2 Enrichment**Solving Equations Using Addition and Subtraction**

Day 3

Write an equation and then solve.

1. The sum of a number and 8 is 15.
Find the number.
2. The difference of a number and 12 is 15. Find the number.
3. If 17 less than a number is 25, find the number.
4. 29 is 12 more than a number.
What is the number?
5. The sum of a number and $6\frac{1}{2}$ is $12\frac{3}{4}$.
Find the number.
6. A number decreased by 6.2 is equal to 10.9. Find the number.
7. The difference of some number and 36 is $12\frac{1}{2}$. What is the number?
8. If $2\frac{2}{3}$ more than a number is $6\frac{1}{2}$
find the number.
9. 14.32 is 15 less than x . Find x .
10. $3\frac{1}{2}$ increased by m is $12\frac{3}{4}$. Find m .
11. The sum of y and 25.8 is 36.5. Find y .
12. The difference of 35.9 and p is 12.7.
Find p .

3

3-3 Enrichment Puzzle

Solve each equation. The first one is completed.

- | | |
|---------------------------|-----------------|
| 1. $\frac{m}{12} = 13$ | 1. <u>156</u> U |
| 2. $17v = -578$ | 2. _____ E |
| 3. $\frac{c}{75} = 18$ | 3. _____ R |
| 4. $-252d = -5796$ | 4. _____ H |
| 5. $64 \cdot w = 5568$ | 5. _____ O |
| 6. $g \div 29 = 61$ | 6. _____ B |
| 7. $p(85) = -7225$ | 7. _____ T |
| 8. $39x = 663$ | 8. _____ I |
| 9. $\frac{k}{18} = 30$ | 9. _____ A |
| 10. $\frac{z}{-94} = -32$ | 10. _____ N |
| 11. $-112q = 1456$ | 11. _____ F |
| 12. $201y = -1608$ | 12. _____ S |

Put the letter that is next to each solution in the box below the corresponding solution shown above.

What is a RINGLEADER?

-85	23	-34		-13	17	1350	-8	-85		87	3008	-34

17	3008		-85	23	-34		1769	540	-85	23	-85	156	1769
												U	

3

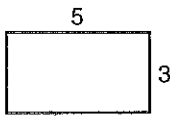
3-5 Enrichment

Area and Perimeter

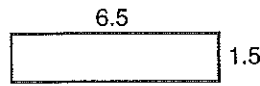
Student Edition
Pages 139-144

Day 4

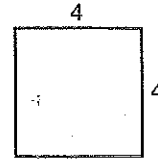
There are countless rectangles with a perimeter of 16 feet. Here are three of them and their areas.



$$\begin{aligned} \text{Area} &= 5 \times 3 \\ &= 15 \text{ ft}^2 \end{aligned}$$



$$\begin{aligned} \text{Area} &= 6.5 \times 1.5 \\ &= 9.75 \text{ ft}^2 \end{aligned}$$



$$\begin{aligned} \text{Area} &= 4 \times 4 \\ &= 16 \text{ ft}^2 \end{aligned}$$

In Exercises 1-4, can you find a rectangle that has a perimeter of 16 feet and the given area? HINT: One rectangle is not possible.

1. Area: 12 ft^2

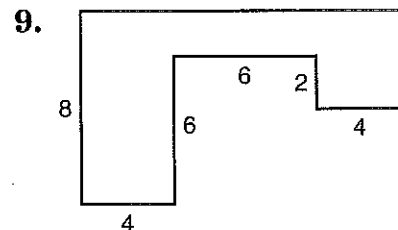
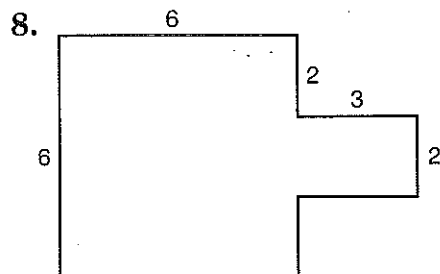
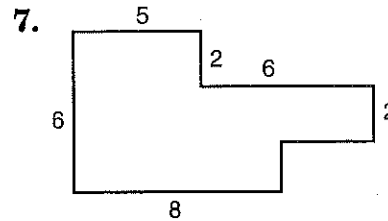
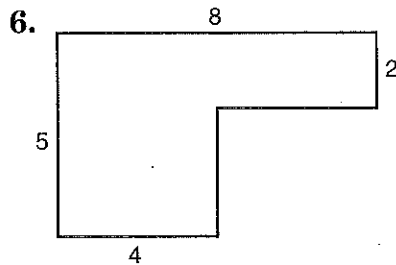
2. Area: 7 ft^2

3. Area: less than 7 ft^2

4. Area: greater than 16 ft^2

5. What is the largest possible area for a rectangle with a perimeter of 20 feet?

Find the area and perimeter of each figure. All angles are right angles.



4-2 Enrichment

Exponents

Numbers can be expressed in several ways. Some numbers are expressed as sums. Some numbers are expressed as products of factors, while other numbers are expressed as powers.

Two ways to express 27 are $3 \cdot 3 \cdot 3$ and 3^3 .

The number 1 million can be expressed in the following ways.

1,000,000	$1000 \cdot 1000$	$100 \cdot 100 \cdot 100$	$10^2 \cdot 10^2 \cdot 10^2$
$1,000,000^1$	1000^2	100^3	10^6

Write names for each number below using the given exponents.

- | | |
|-----------------------------|---------------------------------|
| 1. 16, exponents: 2 and 4 | 2. 81, exponents: 2 and 4 |
| 3. 64, exponents: 2 and 6 | 4. 256, exponents: 2 and 8 |
| 5. 625, exponents: 2 and 4 | 6. 729, exponents: 2 and 6 |
| 7. 2401, exponents: 2 and 4 | 8. 4096, exponents: 2 and 12 |
| 9. 6561, exponents: 2 and 8 | 10. 390,625, exponents: 2 and 8 |

Numbers that can be named as powers with like bases can be multiplied by adding the exponents.

$$8 \cdot 8 = 2^3 \cdot 2^3 = 2^{3+3} = 2^6$$

Write the product of each pair of factors in exponential form.

- | | |
|-------------------|---------------------|
| 11. $9 \cdot 9$ | 12. $4 \cdot 4$ |
| 13. $16 \cdot 8$ | 14. $125 \cdot 25$ |
| 15. $27 \cdot 9$ | 16. $81 \cdot 27$ |
| 17. $49 \cdot 49$ | 18. $121 \cdot 121$ |

4

4-4 Enrichment
Prime Pyramid

Day 5

A **prime number** is a whole number that has exactly two factors—itsself and 1. A pyramid composed of prime numbers is called a *prime pyramid*. Each row of the prime pyramid below begins with 1 and ends with the number of that row. In each row, the numbers from 1 to the row number are arranged such that the sum of any two adjacent numbers is a prime.

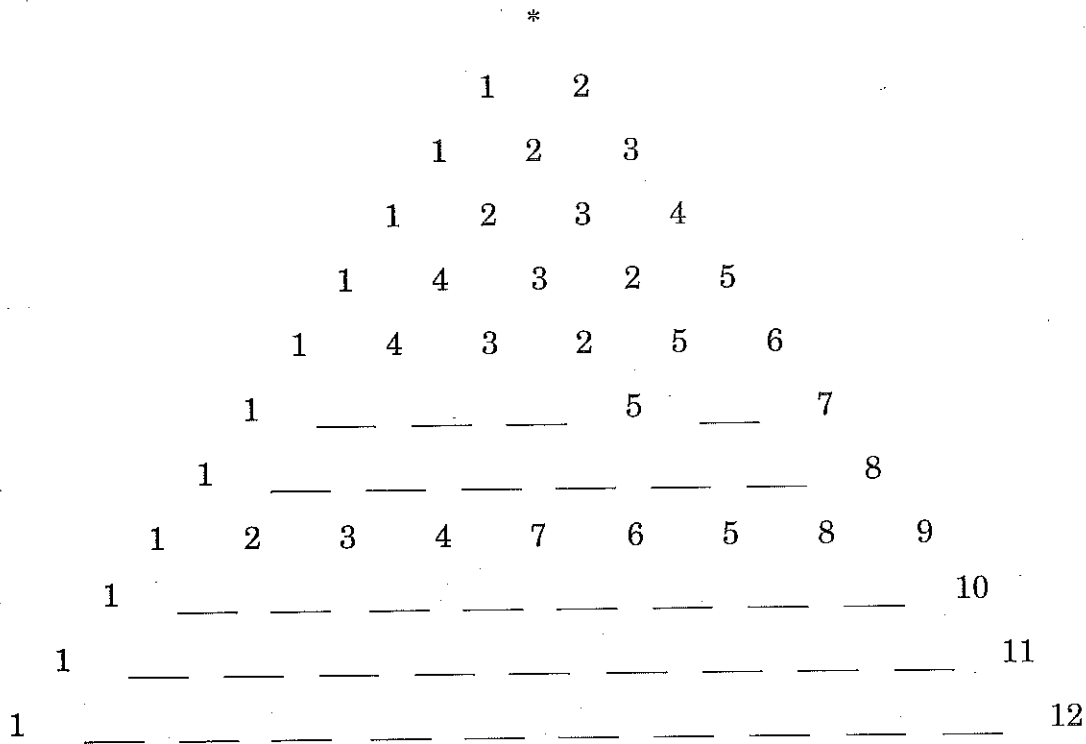
For example, look at row 4:

It must contain the numbers 1, 2, 3, and 4.

It must begin with 1 and end with 4.

The sum of adjacent pairs must be a prime number:

$$1 + 2 = 3, 2 + 3 = 5, 3 + 4 = 7$$



1. Complete the pyramid by filling in the missing numbers.
2. Extend the pyramid to row 13.
3. Explain the patterns you see in the completed pyramid.

5

4-8 Enrichment**Dividing Powers with Different Bases**Student Edition
Pages 205-209

Some powers with different bases can be divided. First, you must be able to write both as powers of the same base.

For example, $\frac{2^5}{8^2} = \frac{2^5}{(2^3)^2} = \frac{2^5}{2^6} = 2^{-1} = \frac{1}{2}$

↑ To find the power of a power,
multiply the exponents.

This method could not have been used to divide $\frac{2^5}{9^2}$, since 9 cannot be written as a power of 2 using integers.

Simplify using the method shown above. Express the solution without exponents.

1. $\frac{8^2}{2^2}$

2. $\frac{16^4}{8^3}$

3. $\frac{9^3}{3^3}$

4. $\frac{81^4}{3^4}$

5. $\frac{3^9}{81^2}$

6. $\frac{32^4}{16^4}$

7. $\frac{125^2}{25^3}$

8. $\frac{6^6}{216^2}$

9. $\frac{10^6}{1000^3}$

10. $\frac{64^3}{8^5}$

11. $\frac{27^5}{9^4}$

12. $\frac{343^3}{7^5}$

5

5-1 Enrichment

Irrational Numbers

Day 6

Decimals in which a digit or group of digits repeats are called **repeating decimals**.

Example: $0.333 \dots = 0.\overline{3}$

$1.454545 \dots = 1.\overline{45}$ The bar indicates the repeating digit or digits.

Decimals in which only a 0 repeats are called **terminating decimals**.

Example: $0.5000 \dots = 0.5$

$42.19500 \dots = 42.195$

Consider the decimal $0.757757775 \dots$. It does not terminate in zero nor does it have a group of digits that repeat. Numbers that are represented by nonterminating, nonrepeating decimals are **irrational numbers**.

Example: $\pi = 3.14159 \dots$

$\sqrt{5} = 2.236068 \dots$

Determine whether the given decimal is repeating or nonrepeating.

1. $0.373373337 \dots$

2. $24.15971597 \dots$

3. $5.71571571 \dots$

4. $0.5795579555 \dots$

5. $8.3121121112 \dots$

Name the next three digits in the following irrational numbers.

6. $0.13141516 \dots$

7. $0.96796679666 \dots$

Name an irrational number between the given numbers.

8. 6.7 and 6.8

9. 17.3 and 17.4

10. $0.1231233 \dots$ and $0.1231134111 \dots$

11. $2.333 \dots$ and $2.444 \dots$

Find each sum.

12. $0.232232223 \dots + 0.323323332 \dots$

13. $0.131131113 \dots + 0.868868886 \dots$

6

5-3 Enrichment

Adding and Subtracting Decimals

1. The chart below shows Mrs. White's credit card statement for September. Find the total amount due.

PB Previous Balance \$1252.86		
Merchandise Description		Amounts (Credit Items Followed by -)
CC	Stereo	786.95
PY	Payment —	420.00-
	Thank You	
FC	Finance Charge	29.16
TT	Total Now Due	

2. Mr. Fair's savings account statement shows the following transactions. What is his balance at the end of the month?

Previous Balance	8/1	\$8792.50
Deposit	8/6	820.40
Deposit	8/9	120.50
Withdrawal	8/15	1260.00
Deposit	8/20	472.26
Withdrawal	8/26	2768.40
Interest	8/27	23.16
Balance	8/31	

3. A weather forecaster kept track of the temperature change over a six-hour period. The temperature at 5:00 A.M. was -10.5°F . What was the temperature at the end of the six-hour period?

1st hour	rise	5.3°
2nd hour	drop	2.1°
3rd hour	drop	4.8°
4th hour	rise	3.5°
5th hour	rise	7.1°
6th hour	drop	2.1°

4. For every 160 hours Marie works, she receives 11.5 hours of vacation. She would like to accumulate at least 50 hours of vacation so she could travel to Mexico. Using the chart, determine how many more hours she needs to work. She receives each additional 11.5 hours only after working a *full* 160 hours.

Month	Hours Worked
January	161.5
February	120
March	138.5
April	110.5
May	170.5

5. A submarine at 1300 meters below sea level descends an additional 1150 meters. How far below sea level is the submarine now?

6. Mike has a box 5.8 inches on each side. If he has a piece of rope 27.4 inches long, how much extra rope will he have after wrapping it around the box once?

6

5-5 Enrichment

Adding and Subtracting Fractions

Student Edition
Pages 244-247

Day 7

Solve each problem. The first one is done for you.

$$1. \frac{7}{14} + \frac{3}{14} = \frac{5}{7} \quad \text{I}$$

$$9. 15\frac{3}{8} + 13\frac{1}{4} = \underline{\hspace{2cm}} \quad \text{L}$$

$$2. \frac{5}{6} + \frac{7}{8} = \underline{\hspace{2cm}} \quad \text{K}$$

$$10. 5\frac{3}{4} + 6\frac{2}{3} = \underline{\hspace{2cm}} \quad \text{F}$$

$$3. \frac{3}{5} + \frac{7}{10} + \frac{1}{15} = \underline{\hspace{2cm}} \quad \text{U}$$

$$11. 8 - 2\frac{2}{3} = \underline{\hspace{2cm}} \quad \text{E}$$

$$4. \frac{3}{8} - \frac{1}{8} = \underline{\hspace{2cm}} \quad \text{A}$$

$$12. 5\frac{5}{7} - 3\frac{1}{6} = \underline{\hspace{2cm}} \quad \text{N}$$

$$5. \frac{6}{10} - \frac{2}{5} = \underline{\hspace{2cm}} \quad \text{G}$$

$$13. 1\frac{5}{24} + \frac{11}{12} = \underline{\hspace{2cm}} \quad \text{O}$$

$$6. 2\frac{2}{3} + \frac{3}{5} = \underline{\hspace{2cm}} \quad \text{D}$$

$$14. 8\frac{1}{6} - 3\frac{5}{8} = \underline{\hspace{2cm}} \quad \text{T}$$

$$7. 8\frac{1}{2} - 6\frac{1}{3} = \underline{\hspace{2cm}} \quad \text{H}$$

$$15. 15\frac{11}{30} + 5\frac{4}{15} = \underline{\hspace{2cm}} \quad \text{C}$$

$$8. 25\frac{1}{9} - 14\frac{5}{6} = \underline{\hspace{2cm}} \quad \text{B}$$

$$16. 15 - 8\frac{2}{3} = \underline{\hspace{2cm}} \quad \text{S}$$

Write the letter that is next to each solution above on the corresponding line shown below to complete the following question. The first letter is completed.

Did you hear about the football player who ...

$$\frac{1}{4} \quad 6\frac{1}{3} \quad 1\frac{17}{24} \quad 5\frac{1}{3} \quad 3\frac{4}{15} \quad 2\frac{1}{6} \quad \frac{5}{7} \quad 6\frac{1}{3} \quad 20\frac{19}{30} \quad 2\frac{1}{8} \quad \frac{1}{4} \quad 20\frac{19}{30} \quad 2\frac{1}{6} \quad 4\frac{13}{24} \quad 2\frac{1}{8}$$

$$12\frac{5}{12} \quad 28\frac{5}{8} \quad 2\frac{1}{8} \quad 2\frac{1}{8} \quad 3\frac{4}{15} \quad 4\frac{13}{15} \quad 2\frac{1}{6} \quad 5\frac{1}{3} \quad 12\frac{5}{12} \quad \frac{5}{7} \quad 5\frac{1}{3} \quad 28\frac{5}{8} \quad 3\frac{4}{15}$$

$$6\frac{1}{3} \quad 2\frac{1}{8} \quad 2\frac{1}{6} \quad 5\frac{1}{3} \quad 20\frac{19}{30} \quad 2\frac{1}{8} \quad 1\frac{11}{30} \quad 28\frac{5}{8} \quad 3\frac{4}{15} \quad \frac{1}{5} \quad 2\frac{1}{8} \quad \frac{5}{7} \quad 2\frac{23}{42}$$

$$\frac{1}{4} \quad 6\frac{1}{3} \quad \frac{1}{4} \quad 6\frac{1}{3} \quad 1\frac{11}{30} \quad 10\frac{5}{8} \quad ?$$

7

5-6 Enrichment

Solving Equations Involving Addition and Subtraction

Solve each equation.

1. $p + 5 = 8$

2. $16 + a = 20$

3. $d - 3\frac{2}{3} = 1\frac{1}{3}$

4. $j + 2\frac{1}{2} = 9\frac{1}{2}$

5. $8.2 + n = 14.2$

6. $g - 5 = 3$

7. $k + 1\frac{2}{3} = 5\frac{2}{3}$

8. $s - 3 = 4\frac{2}{5}$

9. $x + 2\frac{1}{2} = 5$

10. $15 = w + 7$

11. $r + 3.23 = 8.23$

12. $2\frac{4}{5} = t - 4\frac{3}{5}$

13. $7 + y = 11$

14. $1.4 = x - 3.4$

15. $n + 5.3 = 8.7$

16. $g - 1\frac{2}{3} = 1\frac{1}{3}$

17. $n + 7 = 12.23$

18. $24 = x + 18$

19. $\frac{5}{6} = y - \frac{5}{6}$

20. $7 + y = 12$

21. $t - 0.8 = 3.2$

22. $1\frac{2}{3} = n + 1\frac{2}{3}$

Match each solution above to the corresponding letter in the table below. Then place each letter on the appropriate blank at the bottom of the page to form the answer to this riddle.

Why didn't the man receive the basketballs he ordered?

A	B	C	D	E	H	I	K	N	O	S	U
7	3	5	0	4	$7\frac{2}{5}$	$2\frac{1}{2}$	3.4	$1\frac{2}{3}$	5.23	8	6

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19 20 21 22

⑦