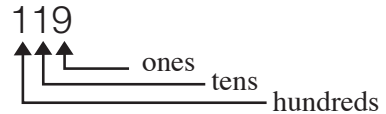


Chapter 1: Number Sense and Operations

Place Value

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Skip Counting

Page 18

By 2s: 2, 4, 6, 8, 10, 12 . . .

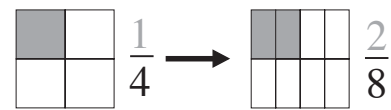
Compare and Order Fractions

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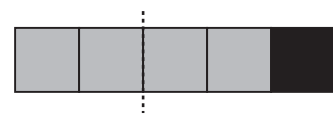
Equivalent Fractions

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Even and Odd Numbers

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Addition and Subtraction

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$$\begin{array}{r} 5 \\ + 8 \\ \hline \end{array} \longrightarrow \begin{array}{r} 5 \\ + 8 \\ \hline 13 \end{array}$$

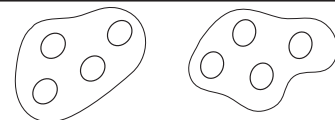
Multiplication

Page 24

$$\begin{array}{r} 7 \\ \times 13 \\ \hline \end{array} \longrightarrow \begin{array}{r} 7 \\ \times 13 \\ \hline 91 \end{array}$$

Division

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Estimating

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$$\begin{array}{r} 207 \\ + 88 \\ \hline 295 \end{array} \longrightarrow \begin{array}{r} 210 \\ + 90 \\ \hline 300 \end{array}$$

Rules of Addition

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$$23 + 14 + 14 + 23 + 37$$

Rules of Multiplication

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$$8 \times 1 = 8$$

Number Sense and Operations Mini-Test

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Fun with Number Sense and Operations

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Skip Counting

Skip counting can help you count and add with large numbers. You can skip count by 2s, 5s, and 10s.

By 2s: 2, 4, 6, 8, 10, 12 . . .

By 5s: 5, 10, 15, 20, 25, 30 . . .

By 10s: 10, 20, 30, 40, 50, 60 . . .

It is also helpful to skip count with 25s, 50s, and 100s.

By 25s: 25, 50, 75, 100, 125, 150...

By 50s: 50, 100, 150, 200, 250, 300...

By 100s: 100, 200, 300, 400, 500, 600...

When can you skip count? You might skip count by 25s to find the value of 5 quarters. You might skip count by 100s to find the number of centimeters in 5 meters. You can use skip counting in many mathematics problems with large numbers.

1 Meena bought 6 peaches for 50¢ each. What was the total cost of the peaches?

- A** 30¢
- B** 56¢
- C** \$3.00
- D** \$6.00

Think it through: You might try to solve this problem by adding $50¢ + 50¢$ many times on a piece of paper. But that could take a while! Instead, solve this problem with skip counting. Start with 50 and make 5 skips, or 6 skips in all. The result is 300. Since there is 100¢ in a dollar, 300¢ equals \$3.00. Therefore the total cost of the peaches was \$3.00.

The correct answer is C.

On Your Own

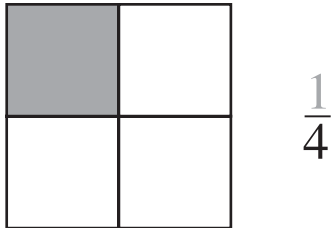
2 Mike has 2 books of stamps with 100 stamps in each book. Kyle has 6 books of stamps with 25 in each book. How many more stamps does Mike have than Kyle?

- F** 50
- G** 150
- H** 225
- J** 500

Compare and Order Fractions

A **fraction** describes parts of a whole or group. The top number of a fraction is the **numerator**. The bottom number is the **denominator**.

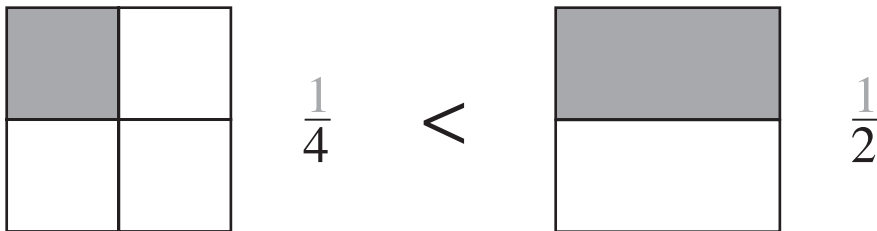
The fraction $\frac{1}{4}$, or one-fourth, explains the shaded part of this shape:



The **numerator** shows that 1 of the 4 parts is shaded.

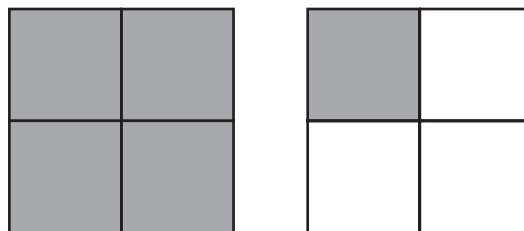
The **denominator** shows that the square has 4 equal parts in all.

Now compare $\frac{1}{4}$ to $\frac{1}{2}$.



These shapes are the same size. But the denominators show that the first shape is divided into 4 equal parts, and the second shape is divided into 2 equal parts. So 1 out of 2 equal parts is greater than 1 out of 4 equal parts.

If the numerator of a fraction is greater than the denominator, then the fraction is greater than 1.



$$\frac{5}{4} = 1\frac{1}{4}$$

1

Put these fractions in order from least to greatest.

$$\frac{1}{8}, \frac{1}{3}, \frac{1}{5}, \frac{1}{2}$$

A $\frac{1}{3}, \frac{1}{5}, \frac{1}{8}, \frac{1}{2}$

B $\frac{1}{2}, \frac{1}{3}, \frac{1}{5}, \frac{1}{8}$

C $\frac{1}{8}, \frac{1}{5}, \frac{1}{2}, \frac{1}{3}$

D $\frac{1}{8}, \frac{1}{5}, \frac{1}{3}, \frac{1}{2}$

Think it through: Compare the fractions. The numerators are the same. But the denominators show that $\frac{1}{8}$ is the smallest fraction. So the correct answer choice begins with $\frac{1}{8}$. Now look at the fractions again. The largest is $\frac{1}{2}$. So the correct answer choice ends with $\frac{1}{2}$. **The correct answer is D.** Another strategy can be applied to ordering a group of fractions when all the numerators are the same. If that is the case, then the greater the denominator, the less the value. **Again, the correct answer is D.**

On Your Own

2

What fraction belongs in the empty box?

F $\frac{1}{8}$

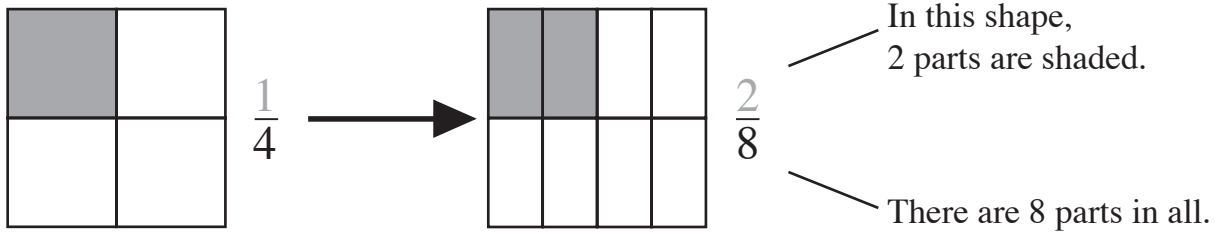
G $\frac{1}{7}$

H $\frac{1}{4}$

J $\frac{1}{2}$

Equivalent Fractions

Two fractions can have the same value. Look at the shaded parts of these shapes. You can see that the fraction $\frac{1}{4}$ is equivalent to $\frac{2}{8}$.



In both shapes, the shaded sections are equivalent. But the first shape has 4 equal parts in all, and the second shape has 8 equal parts. To find out if two fractions are equivalent, compare them. If the numerators or denominators are the same, the fractions cannot be equal. You may also draw a picture to compare.

1 How much of this shape is shaded?

- A $\frac{1}{9}$
- B $\frac{2}{3}$
- C $\frac{6}{3}$
- D $\frac{9}{1}$



Think it through: There are 9 equal parts in this shape. 6 out of 9 parts are shaded. But $\frac{6}{9}$ is not an answer choice. So you must find a fraction that is equivalent to $\frac{6}{9}$.

Compare each choice to $\frac{6}{9}$. When comparing $\frac{1}{9}$ to $\frac{6}{9}$, notice that the two fractions have the same denominator but different numerators. Therefore, $\frac{1}{9}$ and $\frac{6}{9}$ cannot be equivalent. You cannot shade $\frac{6}{3}$ or $\frac{9}{1}$ of the shape, because each of these fractions is greater than 1. So the answer must be $\frac{2}{3}$. To check, circle $\frac{2}{3}$ of the shape; the shaded section should be circled exactly. **The correct answer is B.**

On Your Own

2 Which fraction is *not* equivalent to $\frac{1}{2}$?

- F $\frac{1}{3}$
- G $\frac{2}{4}$
- H $\frac{3}{6}$
- J $\frac{4}{8}$

Even and Odd Numbers

An **even number** can be divided into 2 groups with none left over. When an **odd number** is divided in 2, 1 is always left over. 4 can be divided evenly into 2 groups:



If you divide 5 into 2 groups, 1 is left over:



Odd and even numbers are important when you add and subtract.

ADDITION	SUBTRACTION
odd + odd = even	odd - odd = even
odd + even = odd	odd - even = odd
even + even = even	even - even = even

1 10 + _____

Which number could be written in the box to make an odd sum?

- A 2
- B 9
- C 18
- D 36

Think it through: First, decide if 10 is odd or even. 10 can be divided evenly in 2 groups, so it is even. The only way to make an odd sum from an even number is to add an odd number. So you are looking for the only odd answer choice, 9. Now check the sum of 10 + 9, or 19. If you divide 19 in two groups, 1 is left over. So 9 must be the correct answer.

The correct answer is B.

On Your Own

2 Which addition sentence does **not** make an even sum?

- F $11 + 3$
- G $11 + 5$
- H $11 + 30$
- J $11 + 35$

Addition and Subtraction

When you add, you find a **sum**. To find sums for some addition problems, you must **regroup**. When you regroup, you may group ones into tens. If you add 6 to 7, for example, the sum is greater than 10. Regroup by putting a 1 in the tens place and showing how many are left over in the ones place, 3.

$$\begin{array}{r} 6 \\ + 7 \\ \hline \end{array} \longrightarrow \begin{array}{r} 6 \\ + 7 \\ \hline 13 \end{array}$$

You can regroup in subtraction, too. Look at this problem:

$$\begin{array}{r} 71 \\ - 59 \\ \hline \end{array} \longrightarrow \begin{array}{r} 6 \cancel{1} \\ \cancel{7}1 \\ - 59 \\ \hline 12 \end{array}$$

Start by subtracting the numbers in the ones place. However, you cannot subtract 9 from 1. You must regroup. So exchange a 10 to the ones place and then subtract 9 from 11.

1 $367 + 95 = \underline{\hspace{2cm}}$

- A** 452
- B** 453
- C** 462
- D** 31,513

Think it through: Begin by writing this problem vertically on two lines, like the problems above. This makes regrouping easier. Add the digits in the ones place; the sum is 12, so you must regroup. Write a 2 in the ones place and regroup the 10 to the tens place. But you have to regroup in the tens place, too: 6 tens + 9 tens = 15 tens, plus 1 ten regrouped from the ones place, equals 16 tens. So write 6 in the tens place and regroup the 10 tens to the hundreds place, for a sum of 462. **The correct answer is C.**

On Your Own

2 Shani counted 147 shells at the beach. Lou counted 234 shells. How many more shells did Lou count than Shani?

- F** 87
- G** 97
- H** 187
- J** 197

Multiplication

Multiplication is repeated addition. When you multiply, you add a number to itself at least once. 4×5 , or four groups of five, is a multiplication problem. There are many ways to solve this problem.

You can add 5 to itself 4 times.

$$5 + 5 + 5 + 5 = 20$$

You can add 4 to itself 5 times.

$$4 + 4 + 4 + 4 + 4 = 20$$

You can skip count by 5s.

$$\begin{array}{cccc} 1 & 2 & 3 & 4 \text{ skips} \\ \hline 5, & 10, & 15, & 20 \end{array}$$

You can skip count by 4s.

$$\begin{array}{cccc} 1 & 2 & 3 & 4 & 5 \text{ skips} \\ \hline 4, & 8, & 12, & 16, & 20 \end{array}$$

You can arrange counters into 4 groups of 5.

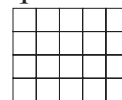


You can draw a model.

5 squares long

Each time, the answer is 20.

4 squares high = 20 squares in all



1

Mel and her 2 sisters are writing postcards. Each girl writes 6 cards. How many cards did they write in all?

- A** 3
- B** 6
- C** 12
- D** 18

Think it through: Read this problem carefully and write a multiplication sentence. The correct sentence is 3×6 , because 3 children wrote 6 cards each. If you add repeatedly, draw a picture, skip count, or use counters, you will find that the total is 18. **The correct answer is D.**

On Your Own

2

$$\begin{array}{r} 12 \\ \times 12 \\ \hline \end{array}$$

- F** 24
- G** 144
- H** 164
- J** 220

Division

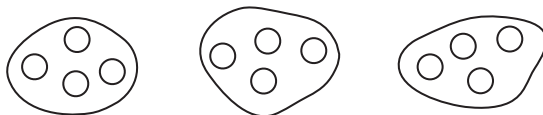
When you **divide**, you break a number into equal groups. The division problem 12 divided by 3 may be written in different ways:

$$12 \div 3$$

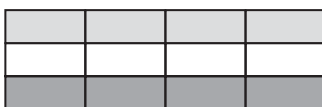
$$3 \overline{)12}$$

$$\frac{12}{3}$$

There are a few ways to solve this problem. You can separate 12 counters into 3 groups.



You can draw a shape to show 12 equal parts in 3 groups.



Any way you show 12 divided by 3, the answer is 4.

- 1** There are 28 children in Mrs. Lee's class. They eat lunch at 4 tables. The same number of children sit at each table. How many children sit at 1 table?

- A** 2
- B** 7
- C** 14
- D** 32

Think it through: Read this problem and decide on the division sentence you must solve. The correct sentence is $28 \div 4$, because the 28 children are divided into 4 equal groups. No matter how you figure out this problem, the answer is 7. To check this answer, multiply. Multiply 4 groups by 7 children in each group, or 4×7 , for a total of 28 children. That matches the number of children in Mrs. Lee's class, so 7 is correct.

The correct answer is B.

On Your Own

- 2** $81 \div 9$

- F** 8
- G** 9
- H** 72
- J** 80

Estimating

When you **estimate**, you make a good guess. You can estimate the number of things in a group. Look at these stars:



It might take a long time to count all the stars in the box. Instead, circle and count 10 stars in one-fourth of the box. Then you can estimate that the whole box has about 10×4 stars in it, or about 40 stars.



You can also estimate to check your answer to a problem. Do this by **rounding** numbers to the nearest 5, 10, or 100. Look at this problem:

$$\begin{array}{r} 207 \\ + 88 \\ \hline 295 \end{array} \quad \longrightarrow \quad \begin{array}{r} 210 \\ + 90 \\ \hline 300 \end{array}$$

Check to see whether 295 makes sense as a sum. Round 207 and 88 to the nearest 10 and add. The new sum is 300, which is close to 295. So 295 makes sense.

- 1** The Oak Street Soccer Team wants to buy new t-shirts. Each shirt costs \$8.97. They have \$36.25 saved so far. How many shirts can they buy now?

- A** 4
- B** 9
- C** 30
- D** 40

Think it through: Estimate to solve this problem. Since \$8.97 is almost \$9.00, you can round it to \$9.00. Since \$36.25 is just a little more than \$36, you can round it to \$36. Then divide 36 by 9. The answer is 4. **The correct answer is A.**

On Your Own

- 2** Tim has a rock collection. He has 61 sedimentary rocks, 97 igneous rocks, and 124 metamorphic rocks. About how many rocks does he have in all?

- F** 280
- G** 310
- H** 380
- J** 400

Rules of Addition

Some rules can help with addition.

- When you add 2 or more numbers, their order does not matter. You can change their order and arrive at the same answer.

$$\begin{array}{r} 32 \\ + 17 \\ \hline 49 \end{array}$$

$$\begin{array}{r} 17 \\ + 32 \\ \hline 49 \end{array}$$

Even when the 32 and 17 are switched, the sum is the same.

Note: Do not change the order of numbers in a subtraction problem. Doing so will change your answer.

- When you must solve a number sentence with addition *and* subtraction, it does not matter which you do first as long as you keep the numbers and operations in the same order.

$$\begin{array}{ccc} & 15 + 10 - 3 = 22 & \\ \swarrow & & \searrow \\ (15 + 10) - 3 = 22 & & 15 + (10 - 3) = 22 \end{array}$$

Whether you solve $15 + 10$ or $10 - 3$ first, the answer is the same.

1 $10 + 7 + 24 = \underline{\hspace{2cm}}$
 $10 + 24 + 7 = \underline{\hspace{2cm}}$

What is another way to write the addition sentence to get the same sum?
Show your work.

Think it through: Find the sum, 41. Then look at the sentences. They use only addition, so the order of numbers doesn't matter. You can switch the numbers a few ways:

$$7 + 10 + 24 = 41 \text{ or}$$

$$7 + 24 + 10 = 41 \text{ or}$$

$$24 + 7 + 10 = 41 \text{ or}$$

$$24 + 10 + 7 = 41$$

On Your Own

2 What is another way to write $20 + 7 - 15$ to get an answer of 12? Show your work.

Rules of Multiplication

These rules can help with multiplication.

- When you multiply a number by 1, the number stays the same.

$$9 \times 1 = 9$$

- When you multiply a number by 0, the answer is always 0.

$$9 \times 0 = 0$$

- When you multiply 2 or more numbers, their order does not matter. You can change their order to arrive at the same answer.

$$\begin{array}{r} 10 \\ \times 5 \\ \hline 50 \end{array}$$

$$\begin{array}{r} 5 \\ \times 10 \\ \hline 50 \end{array}$$

The answer is the same even when the numbers are switched.

1 $2 \times 3 \times 5 = \underline{\hspace{2cm}}$

Show your work.

Think it through: Start at the beginning of the number sentence and multiply through it. 2×3 equals 6. Now multiply 6×5 . **The answer is 30.**

On Your Own

2 $6 \times 1 \times 4 \times 2 = \underline{\hspace{2cm}}$

Show your work.

3 $7 \times 4 \times 0 \times 6 = \underline{\hspace{2cm}}$

Show your work.

Number Sense and Operations

Mini-Test

1 Kiana has 2 boxes of cupcakes with 35 cupcakes in each box. Stephen has 4 boxes of cupcakes with 30 cupcakes in each box. How many **fewer** cupcakes does Kiana have than Stephen?

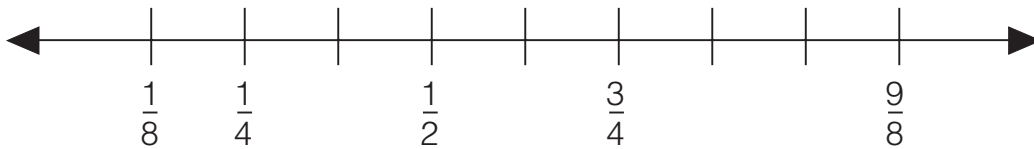
- A** 50
- B** 60
- C** 190
- D** 120

2 Which statement about the number below is **not** true?

5,674

- F** The 5 is in the thousands place.
- G** The 7 is in the ones place.
- H** The 6 is in the hundreds place.
- J** The 4 is in the ones place.

3 Which fraction on the number line below is greater than 1?



- A** $\frac{1}{8}$
- B** $\frac{3}{4}$
- C** $\frac{1}{4}$
- D** $\frac{9}{8}$

4 Ms. Moller's class has 22 students. Ms. Moller gives each student 7 books. How many books did she hand out?

- F** 22
- G** 150
- H** 160
- J** 154

5 Peter counted tiles in the mosaic on the wall of the subway station. There were 17 blue tiles, 137 green tiles, and 42 red tiles. About how many tiles did he count in all?

- A** 160
- B** 180
- C** 300
- D** 200

6 Mrs. Braverman's class counted the number of steps in the flight of stairs near their classroom. If there were 12 steps in a flight, and 6 sets of stairs in the building, how many steps in total are there in the building?

- F** 48
- G** 72
- H** 36
- J** 74

7 Malo was given the task of organizing the clothing drawers for himself and his two brothers. He started with the sock drawers. He had 12 pairs of socks in his drawer. His younger brother had 10 pairs in his drawer. His older brother had 17 pairs in his drawer. How many pairs did the 3 of them have all together?

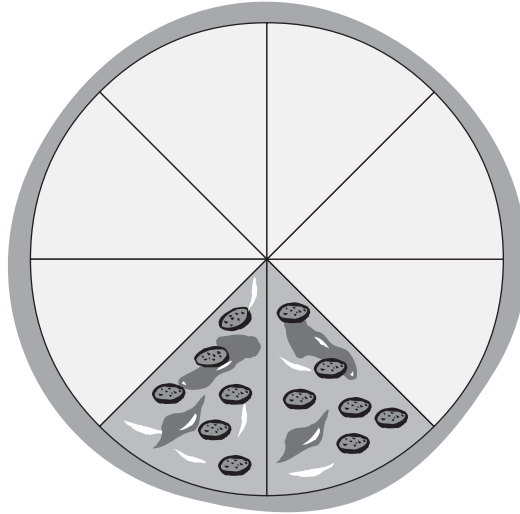
- A** 24
- B** 29
- C** 37
- D** 39

Fun with Number Sense and Operations

1

Leftover Pizza

Erica and Nate were sharing a pepperoni pizza, but they couldn't finish it. Here's what was left over:



What fraction of the pizza did Erica and Nate eat? _____

2

Write a fraction equivalent to the fraction of pizza that Erica and Nate did **not** eat.

3

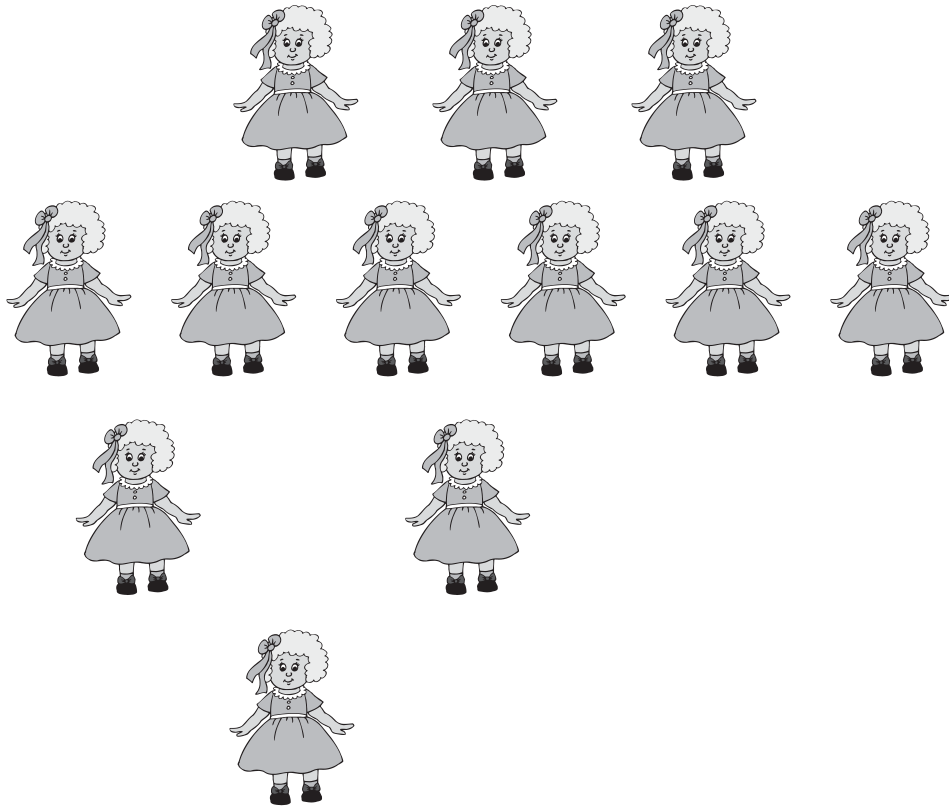
If Nate had eaten only 1 slice and Erica did not eat any, what fraction of the pizza would Nate have eaten?

4

How many slices would Erica and Nate have to eat in order to finish exactly $\frac{1}{2}$ of the pie?

5**Dolly Division**

Diane, DeeDee, and Dana have 12 dolls to share. Draw circles around the dolls to show how to give each girl the same number of dolls.

**6****Even Steven**

Eleanna loves even numbers. She wants to make this odd number of chairs even. Cross out the fewest number of chairs in order to make this group of chairs an even number.

