



Passing the North Carolina
3rd Grade End-of-Grade Test
in
Mathematics

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Diagnostic Test

Part 1

You may use a calculator on this part of the test.

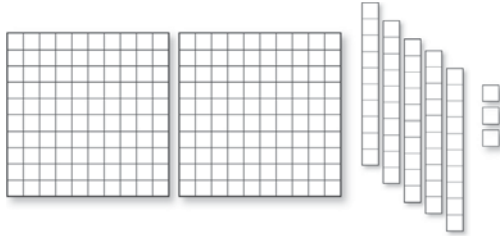
1. Happy Valley Elementary had a two day school carnival. On the first day, 1,398 people came to the carnival. On the second day, 723 people came to the carnival. How many more people came on the first day than the second day?
- A 1,398
B 657
C 2,121
D 675
- 1.02
2. Susita counted 1,287 names in a book for naming babies. What is the correct way of writing the number of names in word form?
- A one thousand, two hundred eighty-seven
B one thousand, two hundred seventy-eight
C two thousand, one hundred eighty-seven
D two thousand, two hundred seventy-eight
- 1.01
3. Which place value is used to show that 6,549 is less than 6,578?
- A thousands place
B hundreds place
C tens place
D ones place
- 1.01
4. A bag of dog treats has 25 pieces in it. Dad gives each of the 3 family dogs 2 pieces. Which expression could be used to find how many dog treats are left in the bag?
- A $25 - (3 \times 2)$
B $25 + (3 \times 2)$
C $25 - (3 + 2)$
D $25 + (3 + 2)$
- 1.04
5. John picked up 64 seashells, and his brother Larry picked up 52 seashells on vacation. About how many more seashells did John pick up than Larry?
- A 10
B 20
C 30
D 40
- 1.02

Modeling Numbers

Models and drawings are another way to represent numbers.

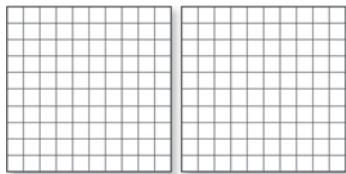
Example 8: Use the model to name the number.

Step 1: Look at the model. What units are shown?



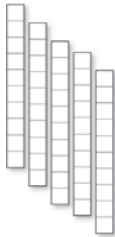
There are hundreds, tens, and ones shown.

Step 2: Start with the largest place value. Name it.



There are two hundreds shown. 200

Step 3: Look at the next largest place value shown, and name it.



There are five tens shown. 50

Step 4: Look at the next largest place value shown, and name it.



There are three ones shown. 3

Step 5: Add all the numbers.

$$200 + 50 + 3 = 253$$

Answer: 253

More Column Subtraction

Example 7: Find the difference. $54 - 28 = \square$

Step 1: Rewrite vertically (\updownarrow) and define columns.

$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 54 \\ - 28 \\ \hline \end{array}$$

Step 2: Subtract each column. Begin with the ones column. Can you take 8 ones away from 4 ones? No! To subtract in the ones column, we have to borrow 10 ones or 1 group of ten from the tens column. Now we can begin to subtract!

$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ \textcircled{4} \quad \textcircled{14} \\ 54 \\ - 28 \\ \hline \end{array}$$

$5 - 1 = 4$ tens $4 + 10 = 14$ ones

Step 3: Subtract from the ones column.

$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 4 \quad 14 \\ \cancel{5}4 \\ - 28 \\ \hline \quad 6 \end{array}$$

Step 4: Subtract from the tens column.

$$\begin{array}{r} \text{Tens} \quad \text{Ones} \\ 4 \quad 14 \\ \cancel{5}4 \\ - 28 \\ \hline 26 \end{array}$$

Answer: 26

9. How many groups of 2 can be made with the pennies below?



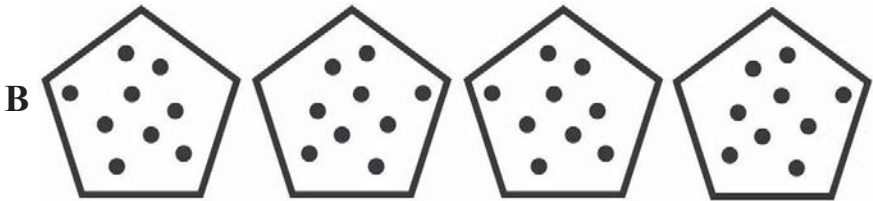
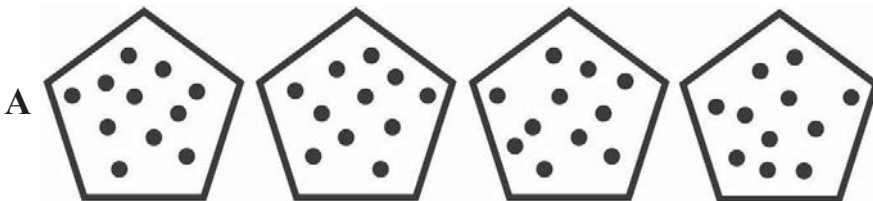
10. How many groups of 9 pebbles can be made from 81 pebbles?

11. Mrs. Anderson made chocolate chip cookies for her kids. There are 15 cookies and 3 kids. If the kids divide the cookies evenly between them, how many cookies will each kid get?

12. Write one problem that can be used to check the multiplication problem: 6×8 .

13. Write one problem that can be used to check the division problem: $96 \div 8$.

14. Which set of figures below is equal to the multiplication problem $4 \times 9 = 36$.



Order of Operations

In long math problems, you must decide what to do first. Without following certain rules, you might get different answers. If you will memorize the silly phrase, Please My Dear Aunt Sally, you can remember the order you must follow.

Please "P" stands for parenthesis. First do the math inside the parenthesis.
 Example: $7 \times (2 + 3) = 7 \times 5 = 35$
 Example: $8 + (9 - 4) = 8 + 5 = 13$

My Dear "M" stands for multiply. "D" stands for division.
 Start on the left of the problem, and do all the multiplication and division in the order they appear.
 Example: $9 \div 3 \times 2 = 3 \times 2 = 6$
 (1st do $9 \div 3$, then take that answer, 3, and multiply by 2.)

Aunt Sally "A" stands for addition. "S" stands for subtraction.
 Start on the left of the problem, and do all the addition and subtraction in the order they appear.
 Example: $7 - 2 + 6 = 5 + 6 = 11$
 (1st do $7 - 2$, then take that answer, 5, and add 6.)

PLEASE MY DEAR AUNT SALLY PLEASE MY DEAR AUNT SALLY

Example 1: Solve using the order of operations: $8 \times (12 \div 4) + 9$

Please Eliminate parenthesis. $(12 \div 4) = 3$,
 so now we have $8 \times 3 + 9$.

My Dear Multiply and divide in order from left to right: $8 \times 3 = 24$,
 so now we have $24 + 9$

Aunt Sally Add and subtract in order from left to right: $24 + 9 = 33$

Example 2: Solve using the order of operations: $6 \times (8 + 3) + 2$

Please Eliminate parenthesis. $(8 + 3) = 11$,
 so now we have: $6 \times 11 + 2$

My Dear Multiply and divide in order from left to right: $6 \times 11 = 66$,
 so now we have $66 + 2$

Aunt Sally Add and subtract in order from left to right: $66 + 2 = 68$

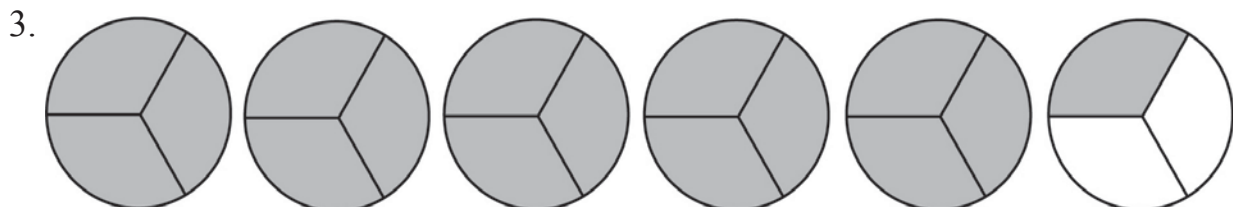
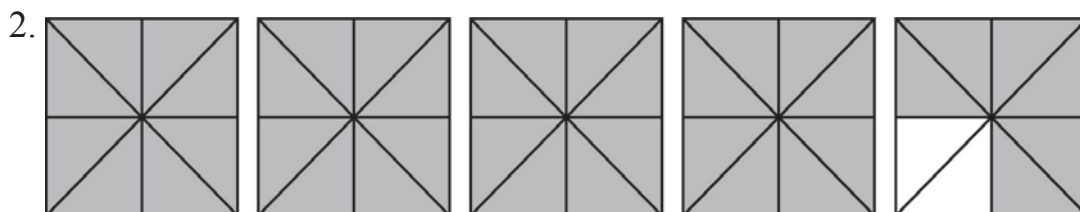
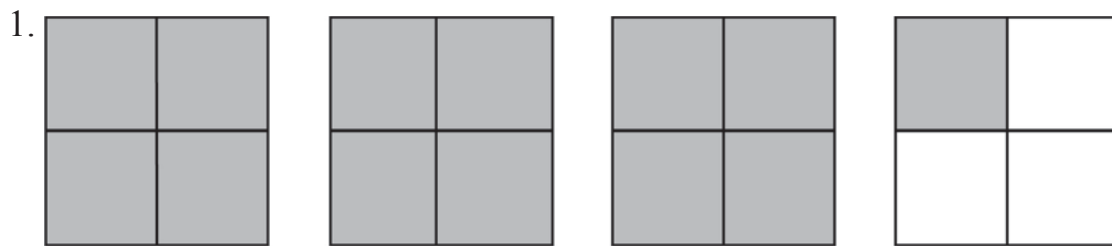
Improper Fractions

Improper fractions are fractions that have larger numerators than denominators. For example, $\frac{5}{3}$ is an improper fraction.

In the shaded model below, there are 16 blocks shaded. Each whole block has 6 parts. The fraction that has the same value as the shaded part of the model is $\frac{16}{6}$.



Write the mixed number for the shaded portion of each model below.



Chapter 6 Test

1. Bobby began baseball practice at 11:30 a.m. If practice lasted for one hour and 30 minutes, what time did it end?

- A 1:00 a.m.
- B 12:00 a.m.
- C 1:00 p.m.
- D 12:30 p.m.

2. If Maria arrived 2 hours and 15 minutes after the time shown below, what time did she arrive?

- A 10:45
- B 11:45
- C 12:45
- D 11:30



3. What time is it on this clock?

- A 9:15
- B 2:45
- C 3:15
- D 1:45



4. Cory's father began driving to a state campground at 12 p.m. If he arrived at 6:30 p.m., how long was his drive?

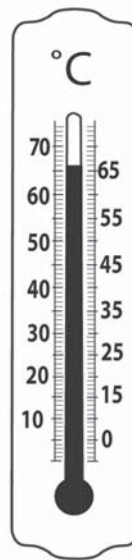
- A 5 hours 30 minutes
- B 6 hours 30 minutes
- C 6 hours
- D 7 hours 30 minutes

5. How long does each employee have to work?

Employees' Weekly Schedule		
	Start	End
Skip	2:00	6:00
Matt	6:00	10:00
Dina	4:00	8:00

- A 9 hours
- B 6 hours
- C 4 hours
- D 12 hours

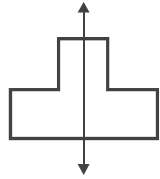
6. What is the temperature reading?



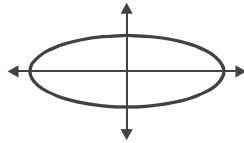
- A 66° C
- B 76° F
- C 62° C
- D 66° F

Line Symmetry

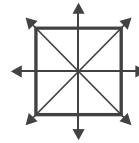
A figure has symmetry if you can draw a line through the figure that divides it into two mirror images. The mirror image line is called the line of symmetry. Look at the figures below.



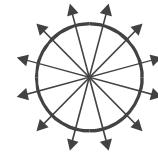
1 line of symmetry



2 lines of symmetry



4 lines of symmetry

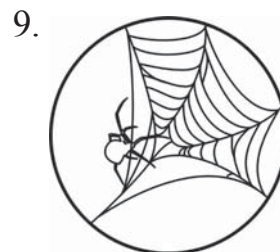
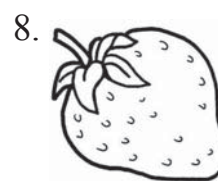
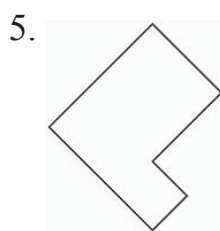
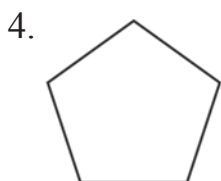
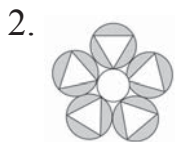
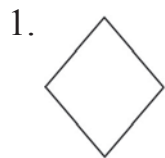
infinite number
of lines of symmetry

If you folded any of the figures above on the lines, the two halves would perfectly line up.

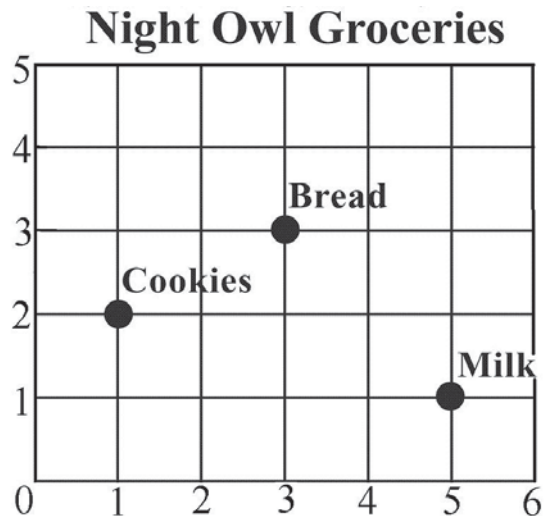
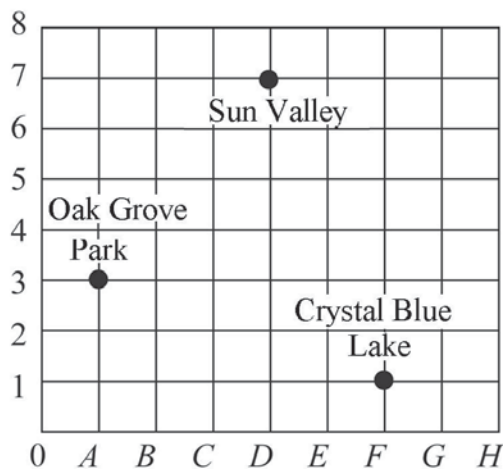
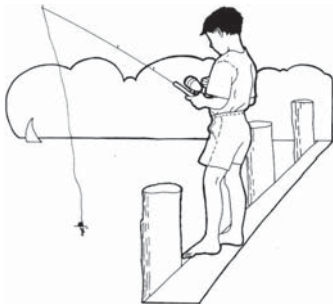
A figure like the ones below do **not** have symmetry. If you folded any of these figures in have they would **not** line up.



Look at each figure below and decide if they have one or more lines of symmetry. If the figure has at least one line of symmetry, write yes. If it doesn't have a line of symmetry, write no.



Look at each coordinate system and answer the questions.

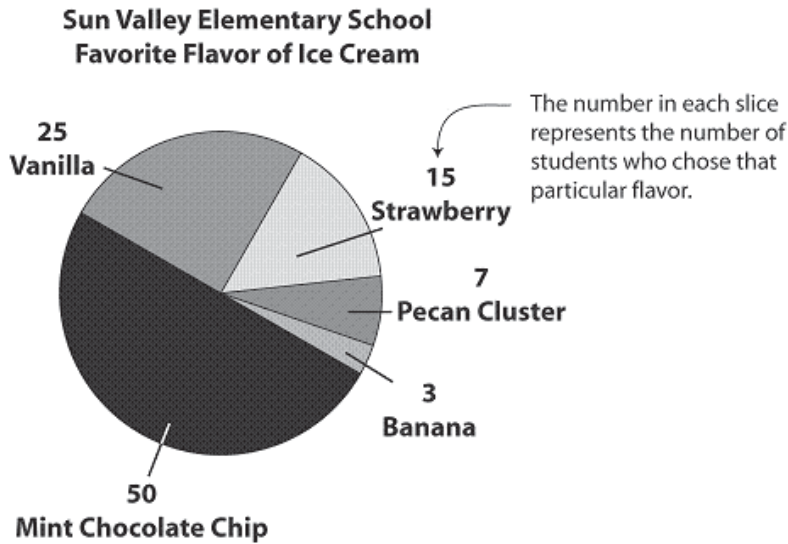


1. Start at Crystal Blue Lake. How many units up and to the left do you need to move to get to Sun Valley?
2. If you are at point $(C, 2)$, how many units up and to the left do you need to move to get to Oak Grove Park?
3. If you are at point $(D, 4)$, how many units down and to the right to get to Crystal Blue lake?
4. If you are in the Night Owl Groceries at the cookie shelf, how many units up and to the right would you go to get to the bread shelf?
5. If you enter the Night Owl Groceries at $(1, 0)$, how many units to the right and up would you go to get to the milk?
6. If you are at the milk, how many units up and to the left would you go to get to the cookie shelf?

Circle Graphs

Circle graphs display information as parts of a whole circle. Circle graphs are sometimes called pie graphs or pie charts.

Example 6: Several students were surveyed to see which flavor of ice cream should be added to the list of flavors in the school cafeteria: mint chocolate chip, strawberry, vanilla, banana, or pecan cluster. Use the circle graph to answer the questions below.



Question: How many students were surveyed? Add up all students by favorite flavor.

Number of students	Flavor
50	Mint Chocolate Chip
25	Vanilla
15	Strawberry
7	Pecan Cluster
<u>3</u>	Banana
100	

Answer: 100 students

Question: Which flavor was selected the most? Look at each slice and determine which one is the largest.

Answer: Mint Chocolate Chip

Question: How many students chose vanilla or strawberry?

Answer: Vanilla = 25 + Strawberry = 15 $25 + 15 = 40$

Read each problem below. Write out the probability, then find the probability as a fraction. The first one is done for you.

1. What is the probability of a numbered cube landing on an odd number?

Written form: **3 out of 6** Fraction form: $\frac{3}{6}$

2. What is the probability of a numbered cube landing on a two?

Written form: _____ Fraction form: _____



3. What is the probability of a numbered cube landing on an even number?

Written form: _____ Fraction form: _____

4. What is the probability of a numbered cube landing on an 1 or a 5?

Written form: _____ Fraction form: _____

5. The hamsters in the bowl are named Skippy, Flippy, Whiffy, Sniffy, Guzzler and Fuzzball. What is the probability that Flippy will be the first one to get out of the bowl?



Written form: _____ Fraction form: _____

6. Samantha has a bag of 8 gumballs. Three of the gumballs are green, two of the gumballs are blue, and three of the gumballs are yellow. If Samantha reaches into the bag without looking, what is the probability that she will pull out a yellow gumball?

Written form: _____ Fraction form: _____

Number Patterns Using Multiplication and Division

Example 5: Find the missing number or term. 2, 4, 8, _____

In this pattern, the number before is multiplied by 2. Therefore, we must multiply 8 by 2 to find the missing term.

$$\begin{array}{cccc}
 2, & 4, & 8, & \underline{16} \\
 \diagdown & / & \diagdown & / \\
 2 \times 2 & 4 \times 2 & 8 \times 2 & \\
 = 4 & = 8 & = 16 &
 \end{array}$$

Answer: 16

Example 6: Find the missing term. 80, 40, 20, _____, 5

In this pattern, each number before has been divided by 2. Therefore, you must divide 20 by 2 to get your answer.

$$\begin{array}{ccccccc}
 80, & 40, & 20, & \underline{10}, & 5 \\
 \diagdown & / & \diagdown & / & \diagdown \\
 80 \div 2 & 40 \div 2 & 20 \div 2 & 10 \div 2 & \\
 = 40 & = 20 & = 10 & = 5 &
 \end{array}$$

Answer: 10

Find the missing terms.

1. 2, 6, 18, _____
2. 1, 10, 100, _____
3. 16, 8, _____, 2
4. 2, 8, 32, _____
5. 8, 8, _____, 8
6. 3, 9, _____, 81
7. 4, 40, _____, 4000
8. 1, 3, 9, 27, _____
9. 1, 5, _____, _____
10. 81, 27, 9, _____
11. 32, 16, _____, _____
12. 8, 40, 200, _____, _____

Finding Number Sentences From Word Problems

Number sentences can be very useful when solving word problems. Writing open number sentences will help determine the missing information.

Example 3: Ms. Baker had 18 desks in her room on Tuesday. On Wednesday, she only had 7 left. How many desks were removed from her classroom?

Step 1: Set up the number sentences.

$$\begin{array}{c}
 18 - \square = 7 \quad \text{or} \quad 18 - 7 = \square \\
 \downarrow \qquad \qquad \downarrow \qquad \qquad \downarrow \qquad \downarrow \qquad \downarrow \\
 \text{Number of desks on Tuesday} \quad \text{Number of desks on Wednesday} \quad \text{Number of desks on Tuesday} \quad \text{Number of desks on Wednesday} \quad \text{Number of desks removed}
 \end{array}$$

Step 2: Solve. $18 - 7 = 11$

Answer: 11

Set up each problem as a number sentence. Then solve.

1. Coach Fritz has 32 players. He divides them into 4 teams. How many players will be on each team?
2. Shawn received 3 gold stars for every A on his report card. If he has 12 gold stars, how many As did he get?
3. Brandon made 8 sandwiches for his family picnic. Darius prepared some sandwiches too. If there were 17 sandwiches at the picnic, how many did Darius make?
4. Chandler and Melanie needed glue sticks for their science project. If Chandler used 4 glue sticks and Melanie used 3, how many did they use together?
5. Christian received a raffle ticket for every 3 cans that he brought to school. If he earned 7 raffle tickets, how many cans did he bring in?
6. Floyd has 9 posters divided evenly on 3 walls in his room. How many posters does he have on each wall?
7. Sinclair had 7 pieces of gum in her purse. If she ate 2 pieces, how many remain?
8. Molly must string 4 beads on 6 separate strings to make bracelets. How many beads will she need?

Practice Test 1

Part 1

You may use a calculator on this part of the test.

1. Which place value is used to show 8, 245 is less than 8, 252?
- A ones place
 - B tens place
 - C hundreds place
 - D thousands place
- 1.01
2. Austin and his dad took their 3 dogs to the vet. The vet said the dogs weighed 6 lb + 1 oz, 4 lb + 9 oz, and 12 lb + 3 oz. What is the total weight of the three dogs?
- A 21 lb + 14 oz
 - B 21 lb + 13 oz
 - C 22 lb + 15 oz
 - D 22 lb + 13 oz
- 2.02
3. Sandy has 83 pretty rocks in her collection. She gave 22 to her younger brother. Then her dad gave her 17 more pretty rocks. How many rocks does Sandy have now?
- A 88
 - B 83
 - C 78
 - D 73
- 1.02
4. Kennedy Elementary held a car wash to earn money for new playground equipment. The morning of the car wash, they raised \$648. The afternoon of the car wash they raised \$756. How much more did they raise in the afternoon than the morning?
- A \$82
 - B \$78
 - C \$92
 - D \$108
- 1.02
5. Omar had a bunch of 36 grapes. He ate 12 on the way to the park, 8 waiting for his turn on the slide, and a dog jumped up and took 7. How many grapes does Omar have left?
- A 8
 - B 9
 - C 10
 - D 12
- 1.02

Practice Test 2

Part 1

You may use a calculator on this part of the test.

1. Samantha helped her grandfather harvest his garden. She counted $1000 + 200 + 50 + 7$ cherry tomatoes. Which of the numbers below is equal to the number of cherry tomatoes Samantha counted?
A 1, 275
B 2, 157
C 1, 725
D 1, 257
1.01
2. Andrew was practicing writing numbers in word form. Which is the correct way to write 7, 829?
A eight thousand, seven hundred twenty-nine
B seven thousand, eight hundred twenty-nine
C seven thousand, two hundred eighty-nine
D seven thousand, eight hundred ninety-two
1.01
3. Which place value is used to show that 3, 621 is less than 3, 711?
A thousands place
B hundreds place
C tens place
D ones place
1.01
4. Farmer Griggs has 5, 670 chickens. Farmer Pruitt has 4, 560 chickens. How many more chickens does Farmer Griggs have than Farmer Pruitt?
A 110
B 1, 010
C 1, 110
D 1, 210
1.02
5. Joseph and his sister, Hannah, were pulling up dandelions in their yard. Joseph pulled up 217 and Hannah pulled up 232. How many less dandelions did Joseph pull up than Hannah?
A 15
B 25
C 16
D 12
1.02