



**pennsylvania**  
DEPARTMENT OF EDUCATION

# The Pennsylvania System of School Assessment

## Mathematics Item and Scoring Sampler

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2015–2016  
Grade 4

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# INTRODUCTION

## General Introduction

The Pennsylvania Department of Education provides districts and schools with tools to assist in delivering focused instructional programs aligned with the Pennsylvania Core Standards (PCS). These tools include Academic Standards, Assessment Anchor documents, assessment handbooks, and content-based item and scoring samplers. This Item and Scoring Sampler is a useful tool for Pennsylvania educators in preparing local instructional programs. It can also be useful in preparing students for the statewide assessment.

## Pennsylvania Core Standards (PCS)

This sampler contains examples of test questions that are aligned to the new Pennsylvania Core Standards-based 2013 PSSA Assessment Anchors and Eligible Content. The Mathematics, Reading, and Writing PSSA transitioned to PCS-based operational Mathematics and English Language Arts assessments starting with the spring 2015 PSSA administration.

The 2013 PCS-aligned Assessment Anchor and Eligible Content documents are posted on this portal:

- [www.education.pa.gov](http://www.education.pa.gov) [Hover over “K–12,” select “Assessment and Accountability,” and select “Pennsylvania System of School Assessment (PSSA).” Then select “Assessment Anchors” from the “Other Materials” list on the right side of the screen.]

## What Is Included

This sampler contains test questions (items) that have been written to align to the Assessment Anchors that are based on the Pennsylvania Core Standards (PCS). The test questions provide an idea of the types of items that will appear on an operational, PCS-based PSSA. Each sample test question has been through a rigorous review process to ensure alignment with the Assessment Anchors.

## Purpose and Uses

The items in this sampler may be used as examples for creating assessment items at the classroom level, and they may also be copied and used as part of a local instructional program.<sup>1</sup> Classroom teachers may find it beneficial to have students respond to the open-ended items in this sampler. Educators can then use the sampler as a guide to score the responses either independently or together with colleagues within a school or district.

## Item Format and Scoring Guidelines

The multiple-choice (MC) items have four answer choices. Each correct response to an MC item is worth one point.

Each open-ended (OE) item is designed to take approximately ten to fifteen minutes to complete. During the administration of the PSSA, students are given additional time as necessary to complete the test items. Each OE item in mathematics is scored using an item-specific scoring guideline based on a 0–4 point scale. In this sampler, every item-specific scoring guideline is combined with examples of student responses that represent each score point to form a practical, item-specific scoring guide.

The sampler also includes the *General Description of Scoring Guidelines for Mathematics Open-Ended Questions* that students will have access to during a PSSA mathematics administration. The general description of scoring guidelines can be distributed to students for use during local assessments and can also be used by educators when scoring local assessments.<sup>1</sup>

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<sup>1</sup> The permission to copy and/or use these materials does not extend to commercial purposes.

## Item Alignment

All PSSA items are aligned to statements and specifications included in the *Assessment Anchors and Eligible Content Aligned to the Pennsylvania Core Standards*. The mathematics content, process skills, directives, and action statements included in the PSSA mathematics questions align with the Assessment Anchor Content Standards. The Eligible Content statements represent the limits of the content of the mathematics questions.

## Testing Time and Mode of Testing Delivery for the PCS-Based PSSA

The PSSA is delivered in traditional paper-and-pencil format as well as in an online format. The estimated time to respond to a test question is the same for both methods of test delivery. During an official testing administration, students are given additional time as necessary to complete the test questions. The following table shows the estimated response time for each item type.

Item Type	MC	OE
Estimated Response Time (in minutes)	2	10 to 15

## MATHEMATICS REPORTING CATEGORIES

The Assessment Anchors are organized into four classifications, as listed below.

- A = Numbers and Operations
- B = Algebraic Concepts
- C = Geometry
- D = Data Analysis and Probability

These four classifications are used throughout the grade levels. In addition to these classifications, there are five Reporting Categories for each grade level. The first letter of each Reporting Category represents the classification; the second letter represents the Domain as stated in the Common Core State Standards for Mathematics. Listed below are the Reporting Categories for Grade 4.

- A-T = Numbers and Operations in Base Ten
- A-F = Numbers and Operations—Fractions
- B-O = Operations and Algebraic Thinking
- C-G = Geometry
- D-M = Measurement and Data

Examples of multiple-choice and open-ended items assessing these categories are included in this booklet.

## **GENERAL DESCRIPTION OF SCORING GUIDELINES FOR MATHEMATICS OPEN-ENDED QUESTIONS**

- 4 – The response demonstrates a *thorough* understanding of the mathematical concepts and procedures required by the task.**

The response provides correct answer(s) with clear and complete mathematical procedures shown and a correct explanation, as required by the task. Response may contain a minor “blemish” or omission in work or explanation that does not detract from demonstrating a *thorough* understanding.

- 3 – The response demonstrates a *general* understanding of the mathematical concepts and procedures required by the task.**

The response and explanation (as required by the task) are mostly complete and correct. The response may have minor errors or omissions that do not detract from demonstrating a *general* understanding.

- 2 – The response demonstrates a *partial* understanding of the mathematical concepts and procedures required by the task.**

The response is somewhat correct with *partial* understanding of the required mathematical concepts and/or procedures demonstrated and/or explained. The response may contain some work that is incomplete or unclear.

- 1 – The response demonstrates a *minimal* understanding of the mathematical concepts and procedures required by the task.**

- 0 – The response has no correct answer and *insufficient* evidence to demonstrate any understanding of the mathematical concepts and procedures required by the task for that grade level.**

Response may show only information copied from the question.

## DESCRIPTION OF SAMPLE QUESTIONS

The mathematics multiple-choice questions begin on page 7. Each question is preceded by the Assessment Anchor and Eligible Content coding to which it aligns. Incorrect answer options are followed by the “rationale” which supports the student’s response. All correct answer options are indicated by an asterisk (\*).

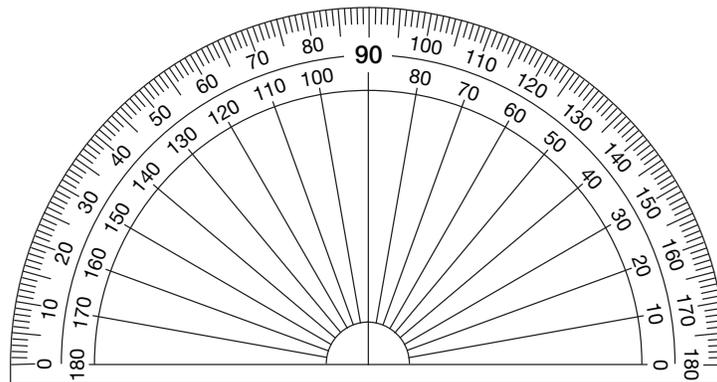
Five open-ended questions follow the multiple-choice questions. Each open-ended question includes question-specific scoring guidelines and examples of student responses with scores and annotations.

Since the PSSA is delivered in both paper-and-pencil and online formats, OE items of each method of test delivery are included in this sampler. The online OE sample items are presented as screen shots in a landscape orientation in order to best approximate the view of a computer monitor. The examples of student responses that follow the online OE sample items are also presented as screen shots.

A calculator is permitted for use in solving questions numbered 4–50 in this sampler. Questions numbered 1–3 are to be solved without the use of a calculator. Scratch paper may be used in solving all questions, and a protractor similar to that shown below should be used to answer question number 50.

## GRADE 4 PROTRACTOR

The protractor shown below is not intended to be used to measure. It has been included as a representation of the protractors that will be provided for students when they take the test. Due to differences in printers, the protractor may not accurately reproduce to scale.



## MATHEMATICS FORMULA SHEET

Below is a Mathematics formula sheet that will be available to students during the test. The formula sheet reflects the mathematical approach included in the Assessment Anchors that are based on the Pennsylvania Core Standards (PCS). The formula sheet is also available in Spanish.

Formulas and conversions that you may need to work questions on this test are found below. You may refer back to this page at any time during the mathematics test. 2016 Grade 4

### Standard Conversions

1 yard (yd) = 3 feet (ft)

1 foot = 12 inches (in.)

1 pound (lb) = 16 ounces (oz.)

1 gallon (gal) = 4 quarts (qt)

1 quart = 2 pints (pt)

1 pint = 2 cups (c)

### Metric Conversions

1 kilometer (km) = 1,000 meters (m)

1 meter = 100 centimeters (cm)

1 kilogram (kg) = 1,000 grams (g)

1 liter (L) = 1,000 milliliters (mL)

### Time Conversions

1 year (yr) = 12 months (mo)

1 year = 52 weeks (wk)

1 year = 365 days

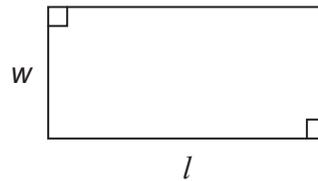
1 week = 7 days

1 day = 24 hours (hr)

1 hour = 60 minutes (min)

1 minute = 60 seconds (sec)

### Rectangle



Area = length  $\times$  width

$$A = l \times w$$

Perimeter = length + length + width + width

$$P = l + l + w + w$$

On the following pages are the mathematics questions.

- You may not use a calculator for questions 1–3. You may use a calculator for all other questions on this test.
- You may need a protractor for question(s) on this test.

**Directions for Multiple-Choice Questions:**

Some questions will ask you to select an answer from among four choices.

For the multiple-choice questions:

- First solve the problem on scratch paper.
- Choose the correct answer and record your choice in the answer booklet.
- If none of the choices matches your answer, go back and check your work for possible errors.
- Only one of the answers provided is the correct response.

**Directions for Open-Ended Questions:**

Some questions will require you to write your response.

For the open-ended questions:

- These questions have more than one part. Be sure to read the directions carefully.
- You cannot receive the highest score for an open-ended question without completing all tasks in the question. For example, if the question asks you to show your work or explain your reasoning, be sure to show your work or explain your reasoning in the space provided.
- If the question does **not** ask you to show your work or explain your reasoning, you may use the space provided, but only those parts of your response that the question specifically asks for will be scored.
- Write your response in the appropriate location within the response box in the answer booklet. Some answers may require graphing, plotting, labeling, drawing, or shading. If you use scratch paper, be sure to transfer your final response and any needed work or reasoning to the answer booklet.

## MULTIPLE-CHOICE QUESTIONS

Questions 1–3 in this sampler are to be solved without the use of a calculator.

## A-T.2.1.3

1. Divide:  $7,218 \div 4$

A. 1,002 *does not do any subtraction, just divides 4 into each value*

B. 1,554 R2 *adds 4 and 1 instead of multiplying in the first step*

C. 1,804 R2 \*

D. 1,840 R2 *4 does not go into 1 in the tens place, so the student brings down the next place value and then divides*

## A-F.2.1.7

2. Chantel made a quilt using fabric squares that measured  $\frac{3}{4}$  foot on each side. She used 6 squares to make the length of the quilt. What is the length, in feet, of Chantel's quilt?

A.  $1\frac{1}{3}$  *multiplies  $6 \times 4$ , then  $6 \times 3$  OR  $6 \times 3$ , then  $6 \times 4$  (both derive  $24/18$ )*

B.  $4\frac{1}{2}$  \*

C.  $6\frac{3}{4}$  *adds the values instead of multiplying*

D. 8 *cross multiplies  $6 \times 4$ , then  $1 \times 3$  and divides*

## A-F.3.1.1

3. Add:  $\frac{8}{100} + \frac{3}{10}$

A.  $\frac{24}{1,000}$

*multiplies numerators and denominators*

B.  $\frac{11}{110}$

*adds numerators and denominators*

C.  $\frac{38}{100}$

\*

D.  $\frac{38}{200}$

*converts  $3/10$  to  $30/100$ , then adds numerators and denominators*

**A calculator is permitted for use in solving questions numbered 4–50 in this sampler.**

## A-T.1.1.1

4. A restaurant served 6,352 meals during one month. Which statement correctly compares the value of the digit 6 in the number of meals served with the value of the digit 3 in the number of meals served?

A. The value of the digit 6 is 2 times the value of the digit 3.

*ignores place value*

B. The value of the digit 6 is 3 times the value of the digit 3.

*takes  $6 - 3$  and ignores place value*

C. The value of the digit 6 is 20 times the value of the digit 3.

\*

D. The value of the digit 6 is 30 times the value of the digit 3.

*takes  $6 - 3$  then uses place value*

## A-T.1.1.4

5. Mr. Coffman saw this ad for a used car in the newspaper.

<b>Car for Sale</b>
<ul style="list-style-type: none"> <li>• red</li> <li>• CD player</li> <li>• new tires</li> <li>• runs well</li> <li>• 126,500 miles (rounded to the nearest 100)</li> </ul>

What is the **greatest** number of miles that the car could have been driven?

- |                  |  |
|------------------|--|
| A. 126,450 miles | <i>least number of miles that rounds to 126,500</i>                  |
| B. 126,499 miles | <i>greatest number of miles under 126,500 that rounds to 126,500</i> |
| C. 126,549 miles | *  |
| D. 126,550 miles | <i>least number of miles that rounds to 126,600</i>                  |

A-T.1.1.2

A-T.1.1.3

6. The populations of two towns are listed below.

Springfield: three hundred four thousand, twenty

Greenville: three hundred forty thousand, two

Which inequality correctly compares the two populations?

A.  $300,420 < 342,000$

*does not correctly convert from word form to number form but compares the numbers correctly*

B.  $304,020 < 340,002$

\*

C.  $340,002 < 304,020$

*converts from word form to number form correctly but does not correctly compare the numbers*

D.  $342,000 < 300,420$

*does not correctly convert from word form to number form and does not correctly compare the numbers*

A-T.1.1.2

A-T.1.1.4

7. When rounded to the nearest ten thousand, Jake's high score on a video game is 170,000 points. Which could be Jake's actual high score?

A. sixteen thousand, seven hundred thirty-five

*thinks this represents 167,350 instead of 16,735 and rounds correctly*

B. one hundred seventeen thousand, two hundred forty-one

*reads this as 170,241*

C. one hundred sixty-two thousand, nine hundred ninety-nine

*makes a rounding error, thinking this rounds up because of the 999*

D. one hundred seventy-three thousand, nine hundred twenty-two

\*

## A-T.2.1.1

8. Graham practiced piano for 135 minutes this morning. He practiced for 65 more minutes this afternoon. Altogether, Graham practiced 10 times longer today than he practiced yesterday. How many minutes did Graham practice piano yesterday?

- A. 2
- B. 20 \*
- C. 200
- D. 2000

## A-T.2.1.1

9. Mt. Etna is a volcano that measures 10,925 feet above sea level at its highest point. This is 11,664 feet less than the height of the world's highest volcano. What is the height, in feet, of the world's highest volcano?

- A. 21,589
- B. 21,599
- C. 22,581
- D. 22,589 \*

A-T.2.1.1

A-T.1.1.4

10. The number of houses in each of three cities is shown below.

- City 1 has 49,508 houses.
- City 2 has 650,279 houses.
- City 3 has 124,908 houses.

What is the total number of houses in all three cities rounded to the nearest thousand?

- A. 820,000 *rounds to ten thousands*
- B. 823,000 *rounds each number down to thousands and then adds*
- C. 824,000 *adds 3 numbers and then rounds down to thousands*
- D. 825,000 \*

A-T.2.1.2

A-T.2.1.1

11. Ruth and Mari sold fruit baskets for a school fundraiser. Ruth sold 42 fruit baskets. Mari sold twice as many fruit baskets as Ruth. They sold each fruit basket for \$9. What is the total amount of money Ruth and Mari made selling fruit baskets?

- A. \$126 *total number of fruit baskets*
- B. \$378 *amount of money Ruth made*
- C. \$756 *amount of money Mari made*
- D. \$1,134 \*

## A-F.1.1.2

12. Jason has a red pail and a blue pail that are the same size. The red pail is  $\frac{3}{5}$  full with water. The blue pail is  $\frac{9}{10}$  full with water. Which statement **best** explains why the blue pail has more water in it?

A. The numerator 9 is greater than the numerator 3.

*ignores the denominators*

B. The denominator 10 is greater than the denominator 5.

*ignores the numerators*

C. The fraction  $\frac{3}{5}$  is equal to  $\frac{6}{10}$ , and  $\frac{6}{10}$  is less than  $\frac{9}{10}$ .

\*

D. The difference between the numerator and the denominator in  $\frac{9}{10}$  is less than it is in  $\frac{3}{5}$ .

*true only for fractions that have a common denominator and are less than or equal to 1*

## A-F.2.1.2

13. Kim's family had  $1\frac{1}{4}$  apple pies remaining after a party. Each of the 6 people in Kim's family ate apple pie until all the apple pie was gone. Which expression could show the amount of apple pie each of the 6 people in Kim's family ate?

A.  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

*does not account for all 6 people in Kim's family*

B.  $\frac{1}{4} + \frac{1}{4} + \frac{2}{8} + \frac{2}{8} + \frac{2}{8} + \frac{2}{8}$

*treats the 1/4s as 1/8s*

C.  $\frac{1}{8} + \frac{1}{8} + \frac{2}{8} + \frac{2}{8} + \frac{2}{8} + \frac{2}{8}$

\*

D.  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{2}{8} + \frac{2}{8}$

*does not add the fractions correctly*

## A-F.2.1.3

14. To make a repair, Jane needs a piece of wood that is  $7\frac{1}{8}$  inches long. She has a piece of wood that is  $12\frac{5}{8}$  inches long. How many inches of wood needs to be cut off so she has exactly  $7\frac{1}{8}$  inches remaining?

- A.  $4\frac{4}{8}$
- B. 5
- C.  $5\frac{4}{8}$  \*
- D.  $5\frac{6}{8}$

## A-F.2.1.4

15. In Mr. Thom's marble collection,  $\frac{5}{12}$  of the marbles are glass and  $\frac{3}{12}$  of the marbles are steel. What fraction of the marbles in Mr. Thom's marble collection are either glass or steel?

- A.  $\frac{1}{6}$
- B.  $\frac{1}{3}$
- C.  $\frac{5}{8}$
- D.  $\frac{2}{3}$  \*

A-F.2.1.7

A-F.3.1.2

16. A fruit drink is made from orange juice and pineapple juice. Orange juice makes up  $\frac{7}{10}$  of the fruit drink. What is the amount of orange juice in 8 gallons of the fruit drink?

- A. 1.5 gallons *incorrect fraction (15/10), correct conversion*
- B. 5.6 gallons \*
- C. 15 gallons *incorrect fraction (15/10), incorrect conversion*
- D. 56 gallons *correct fraction (56/10), incorrect conversion*

A-F.3.1.1

A-F.3.1.2

17. On Jenny's farm  $\frac{48}{100}$  of the trees are pine trees and  $\frac{3}{10}$  of the trees are birch trees. What decimal number is equal to the fraction of the trees on Jenny's farm that are either pine trees or birch trees?

- A. 0.051 *incorrect sum of 51/100 and incorrect placement of decimal point*
- B. 0.078 *correct sum of 78/100 but incorrect placement of decimal point*
- C. 0.51 *incorrect sum of 51/100 but correct placement of decimal point*
- D. 0.78 \*

A-F.3.1.2

A-F.3.1.1

A-F.2.1.3

18. Ramon bought 2.03 pounds of grapes last week. He bought 1.1 pounds of grapes this week. Which number sentence shows how many pounds of grapes Ramon bought in all?

A.  $2\frac{3}{10} + 1\frac{1}{10} = 3\frac{4}{10}$  *converts 2.03 incorrectly*

B.  $2\frac{3}{100} + 1\frac{1}{10} = 3\frac{4}{110}$  *adds denominators*

C.  $2\frac{3}{100} + 1\frac{1}{100} = 3\frac{4}{100}$  *converts 1.1 incorrectly*

D.  $2\frac{3}{100} + 1\frac{10}{100} = 3\frac{13}{100}$  \*

A-F.3.1.3

19. Which statement correctly compares 10.26 and 10.35?

A. Since  $2 + 6 = 8$  and  $3 + 5 = 8$ ,  $10.26 = 10.35$ .  
*adds the numbers after the decimal together to establish their values*

B. Since the whole numbers are the same,  $10.26 = 10.35$ .  
*compares the whole values correctly, but stops there*

C. Since the 2 in the tenths place is less than 3,  $10.26 < 10.35$ .  
 \*

D. Since the 6 in the hundredths place is greater than 5,  $10.26 > 10.35$ .  
*compares the decimal values from right to left instead of left to right*

## B-O.1.1.1

20. Leo and Rachel have boxes of chalk.

- Leo has 6 boxes with 8 pieces in each box.
- Rachel has 8 boxes with 6 pieces in each box.

Which number sentence correctly shows the relationship between the total number of pieces of chalk in Leo's and Rachel's boxes?

A.  $6 + 8 = 8 + 6$

*uses addition instead of multiplication*

B.  $6 + 8 < 8 + 6$

*chooses the inequality sign based on the first number in each addition expression*

C.  $6 \times 8 = 8 \times 6$

\*

D.  $6 \times 8 < 8 \times 6$

*chooses the inequality sign based on the first number in each multiplication expression*

## B-O.1.1.2

## B-O.3.1

21. Claire writes a number pattern that starts with 5 and follows the rule "multiply by 2." Meg writes another number pattern. The fourth number in Meg's pattern is 6 times as large as the fourth number in Claire's pattern. Which expression is equal to the fourth number in Meg's pattern?

A.  $6 + 30$

*starts with 5 and multiplies by 2, so thinks patterns are the 10s (5, 10, 20, 30, ...) and then adds instead of multiplies*

B.  $6 + 40$

*adds instead of multiplies*

C.  $6 \times 30$

*starts with 5 and multiplies by 2, so thinks patterns are the 10s (5, 10, 20, 30, ...)*

D.  $6 \times 40$

\*

## B-O.1.1.3

22. Peter, Ingrid, and Anna collect posters. Peter has 14 posters. Ingrid has 6 more posters than Peter. Anna has 3 times as many posters as Ingrid. How many posters do Peter, Ingrid, and Anna have altogether?

A. 46

*uses 8 posters ( $14 - 6$ ) for Ingrid and 24 posters ( $3 \times 8$ ) for Anna*

B. 76

*uses 42 posters ( $3 \times 14$ ) for Anna*

C. 94

\*

D. 104

*uses 42 posters ( $3 \times 14$ ) for Anna and 48 posters ( $42 + 6$ ) for Ingrid*

## B-O.1.1.3

23. Omar has 25 books. Nan has 3 times as many books as Omar. Nan stores her books in boxes that hold 6 books each. She fills as many boxes as she can and puts the remaining books on a shelf. How many books does Nan put on the shelf?

A. 1

*divides 25 by 6*

B. 3

\*

C. 4

*divides 28 by 6 (thinks Nan has 3 more books than Omar)*

D. 5

*interprets the 5 in 12.5 as 5 remaining books*

**B-O.1.1.3**

**B-O.1.1.1**

24. On vacation, Lou took  $p$  photographs. He used 4 times as many memory cards as Kathy. Kathy used 2 memory cards and each card contained 240 photographs. Which equation shows how many photographs ( $p$ ) Lou took while on vacation?

A.  $4 + p = 2 \times 240$

*interprets "4 times as many" as "4 +" AND switches Lou's amount with Kathy's amount*

B.  $4 + 2 \times 240 = p$

*interprets "4 times as many" as "4 +"*

C.  $4 \times p = 2 \times 240$

*switches Lou's amount with Kathy's amount*

D.  $4 \times 2 \times 240 = p$

\*

**B-O.1.1.4**

25. Mr. Jones has 50 paintbrushes to give to each of his two art classes.

- His first class has 7 students.
- His second class has 9 students.

During class, Mr. Jones gives each student the same number of paintbrushes. He gives out as many paintbrushes as possible. He then writes the statement shown below to compare the number of paintbrushes he has remaining from each class.

number remaining from the first class  number remaining from the second class

What symbol should go into the  to make the comparison true?

A.  $<$  \*

B.  $>$

*uses the inequality sign to point to the larger number OR thinks  $50 - 7 > 50 - 9$*

C.  $=$

*thinks Mr. Jones will have 0 brushes left from each class, not noticing that neither 7 nor 9 goes into 50 evenly*

D.  $\div$

*division is used in the problem but not for the comparison*

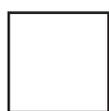
**B-O.2.1.1**

26. How many numbers are both multiples of 4 and factors of 36?

- A. 0
- B. 1
- C. 2
- D. 3 \*

**B-O.3.1**

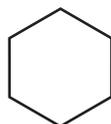
27. Paula starts making a pattern by drawing the shapes shown below.



Shape 1



Shape 2



Shape 3



Shape 4

The pattern continues. How many sides will Shape 20 have?

- A. 17
- B. 20
- C. 22
- D. 23 \*

## B-O.3.1.2

28. Jarod keeps his coin collection in a coin book. The table below shows the total number of coins he has stored based on the number of pages with coins.

Coin Collection

Number of Pages	Number of Coins
3	18
7	42
11	66
15	90

How many coins does Jarod store on each page of the book?

- A. 4
- B. 6 \*
- C. 18
- D. 24

B-O.3.1.2

B-O.3.1.3

29. Mrs. Lawson plants the same number of flowers in her garden each week. The table below shows the total number of flowers in her garden at the end of weeks 2, 3, and 4.

Mrs. Lawson's Garden

Week	Number of Flowers
2	8
3	12
4	16
5	?

The pattern continues. Which number sentence could be used to find the number of flowers in Mrs. Lawson's garden at the end of week 5?

A.  $5 + 4 = 9$

*recognizes a pattern (add 4) but adds it to Week*

B.  $5 + 12 = 17$

*since  $4 + 12 = 16$*

C.  $5 \times 4 = 20$

\*

D.  $5 \times 5 = 25$

*since  $4 \times 4 = 16$*

## B-O.3.1.3

30. The cost for Akito to call his aunt in Japan is shown in the table below.

**Cost of Phone Call**

Time (minutes)	Cost (cents)
1	10
2	20
3	30
4	40

Which pair of equations show two different ways Akito could find the cost to call his aunt for 5 minutes?

A.  $40 + 40 = 80$  and  $40 \times 2 = 80$

*thinks the amount doubles each time, just looking at the first two values in the table*

B.  $40 + 5 = 45$  and  $5 \times 9 = 45$

*thinks the previous cost should be added to the number of minutes (and then comes up with a multiplication equation to match)*

C.  $40 + 10 = 50$  and  $5 \times 10 = 50$

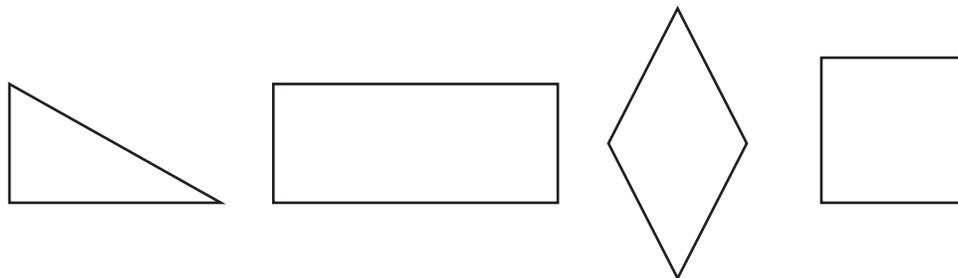
\*

D.  $40 + 160 = 200$  and  $40 \times 5 = 200$

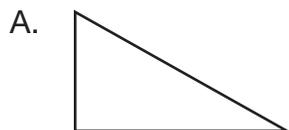
*thinks the previous cost should be multiplied by 5 (and then comes up with an addition equation to match)*

C-G.1

31. Marisa is using the right triangle, rectangle, rhombus, and square shown below for an art project.



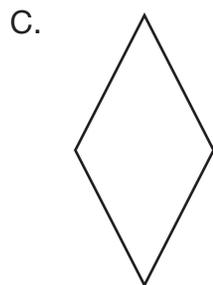
Marisa cuts one of the shapes along a line of symmetry to form two new shapes. The two new shapes can be identified by the same shape name as the shape that was cut. Which shape did Marisa cut?



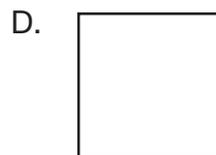
*no line of symmetry*



\*



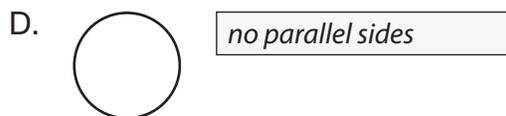
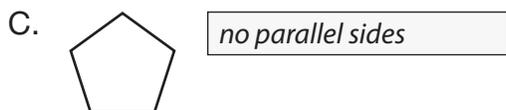
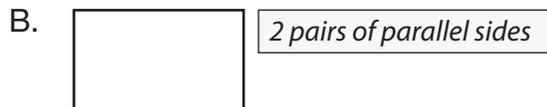
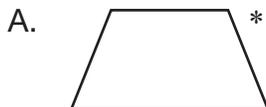
*line of symmetry would form 2 triangles*



*line of symmetry would form 2 rectangles or 2 triangles*

C-G.1.1

32. The top of Ricky’s kitchen table has exactly one pair of parallel sides. Which figure could be the shape of the top of Ricky’s kitchen table?



C-G.1.1.2

33. A company chooses a shape for its new logo. The shape has only obtuse angles and exactly three sets of parallel line segments. Which shape could be the new logo?

A. hexagon \*

B. pentagon *can contain only obtuse angles but not three sets of parallel line segments*

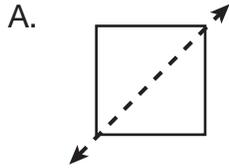
C. square *contains no obtuse angles and only two sets of parallel line segments*

D. triangle *contains one obtuse angle at most and no parallel line segments*

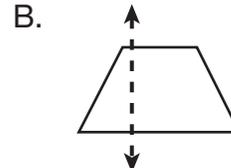
C-G.1.1.1

C-G.1.1.3

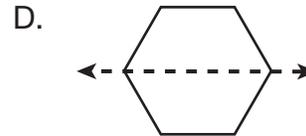
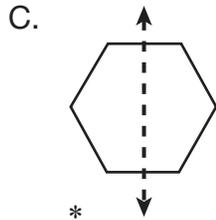
34. Jeremy has a gameboard which folds along a line of symmetry that is perpendicular to one side of the board. Which figure could be Jeremy's gameboard with its line of symmetry?



*line of symmetry, but not perpendicular*



*perpendicular, but not a line of symmetry*



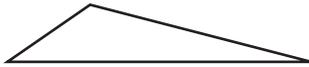
*line of symmetry, but not perpendicular*

C-G.1.1.2

C-G.1.1.1

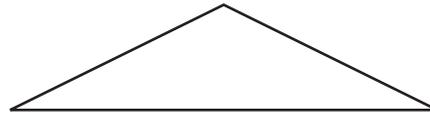
35. A triangular store display is built from three pieces of wood. Exactly two of the pieces of wood are the same size, and the angle formed by these two pieces of wood is an obtuse angle. Which picture could be the shape of the triangular display?

A.



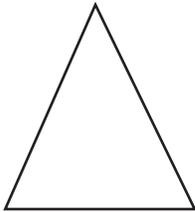
*obtuse angle, but no congruent sides*

B.



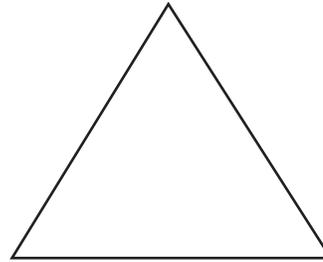
\*

C.



*exactly two congruent sides, but no obtuse angles*

D.



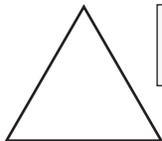
*three congruent sides, and no obtuse angles*

C-G.1.1.3

C-G.1.1.1

36. Which shape has both a line of symmetry and an obtuse angle?

A.



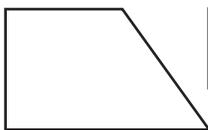
*has a line of symmetry, but no obtuse angles*

B.



*has obtuse angle, but no line of symmetry*

C.



*has obtuse angle, but no line of symmetry*

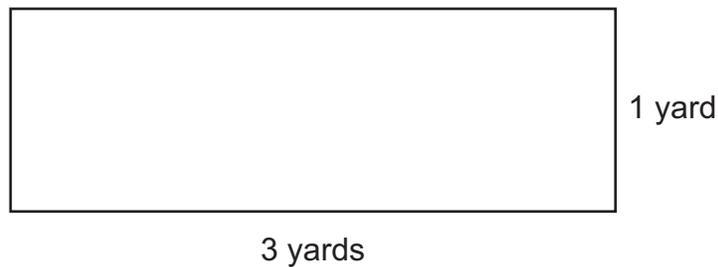
D.



D-M.1

37. Jason bought a rectangular canvas and a square canvas with the same perimeter. The rectangular canvas is shown below.

**Rectangular Canvas**



What is the length, in **feet**, of one side of the square canvas?

A. 2

*length, in yards, of one side of square canvas*

B. 3

*adds only 3 and 9 to get perimeter of 12*

C. 6

\*

D. 9

*length, in feet, of longer side of rectangular canvas*

## D-M.1.1.2

38. Mikail rode her bike  $1\frac{3}{4}$  miles from her school to the park. She then rode her bike  $2\frac{3}{4}$  miles from the park to her home. What is the total distance Mikail rode her bike from her school, to the park, and to her home?

A.  $3\frac{3}{8}$  miles

*adds denominators, keeps common numerators*

B.  $3\frac{2}{4}$  miles

*converts the fraction  $\frac{6}{4}$  as  $1\frac{2}{4}$ , but does not regroup the 1*

C.  $3\frac{6}{8}$  miles

$\frac{3}{4} + \frac{3}{4} = \frac{6}{8}$

D.  $4\frac{2}{4}$  miles

\*

## D-M.1.1.4

## D-M.1.1.2

39. Lucy started knitting a scarf at a quarter to 5. She finished knitting the scarf at 10 minutes after 7. How many minutes did it take Lucy to knit the scarf?

A. 115

*uses 5:15 for "quarter to 5"*

B. 125

*uses 6:50 for "10 minutes after 7"*

C. 145

\*

D. 225

*incorrectly converts 2 hours 25 minutes*

D-M.2.1  
A-F.2.1.5

40. The students in Ms. Padah’s class have different ways of getting to school, as listed below.

- 12 students get to school by bus.
- $\frac{1}{2}$  as many students get to school by car as by bus.
- $\frac{1}{2}$  as many students get to school by bike as by car.
- 5 students get to school by walking.

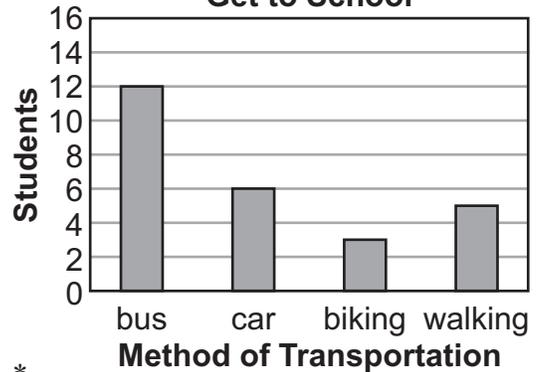
Which data display correctly represents the different ways Ms. Padah’s students get to school?

A. **Ways Ms. Padah’s Students Get to School**

Method of Transportation	Students
bus	
car	
biking	
walking	

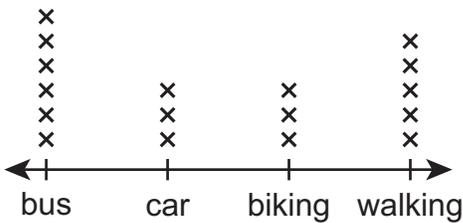
*reverses the numbers for riding in a car and biking*

B. **Ways Ms. Padah’s Students Get to School**



\*

C. **Ways Ms. Padah’s Students Get to School**



Key: x = 2 students

*forgets to divide by 2 for biking and does not use the key for walking to school*

D. **Ways Ms. Padah’s Students Get to School**

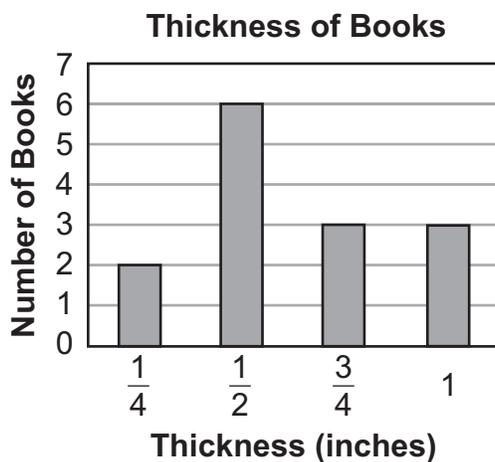
Method of Transportation	Students
bus	
car	
biking	
walking	

Key: = 3 students

*does not interpret the key correctly for walking*

D-M.2.1.2

41. Ellie is sorting books based on their thickness in inches. She makes a bar graph to show the number of books she has of each thickness.



Ellie stacks all of the books on top of one another. How thick is Ellie’s stack of books?

- A.  $2\frac{1}{2}$  inches *adds one of each different thickness*
- B.  $5\frac{3}{4}$  inches *forgets to include the three 1-inch books*
- C.  $8\frac{3}{4}$  inches \*
- D. 14 inches *counts the total number of books*

D-M.2.1.1

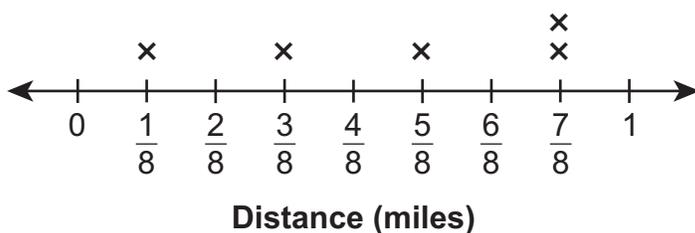
A-F.1.1.1

42. In the time it took Gia to run a mile, five other runners had run the distances, in miles, shown below.

$$\frac{1}{2} \quad \frac{5}{8} \quad \frac{3}{4} \quad \frac{7}{8} \quad \frac{7}{8}$$

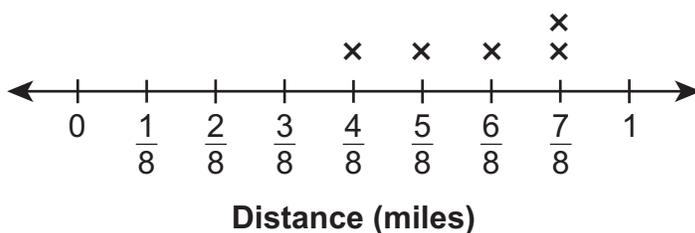
Which line plot shows the distances, in miles, the other five runners had run?

A. **Running Distances**



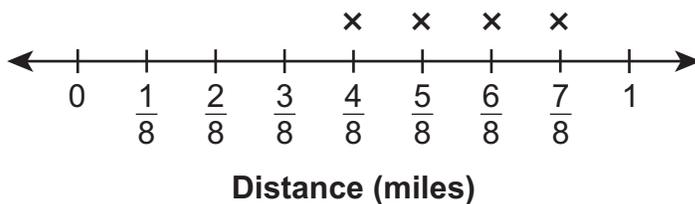
*only uses the numerators*

B. **Running Distances**



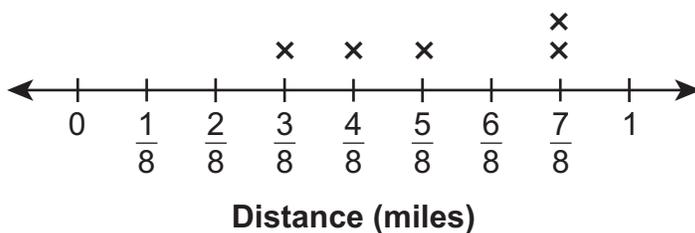
\*

C. **Running Distances**



*includes just one x for each unique value*

D. **Running Distances**



*correctly converts 1/2 to 4/8 but incorrectly converts 3/4 to 3/8*

D-M.3

43. Craig draws two angles. The smaller angle is an acute angle, and the larger angle is an obtuse angle. The measure of the smaller angle is  $10^\circ$  less than the measure of the larger angle. Both angle measures are whole numbers of degrees. What is the **greatest** possible measure of the larger angle?

- A.  $89^\circ$  *greatest possible measure of the smaller angle*
- B.  $91^\circ$  *least possible measure of the larger angle*
- C.  $99^\circ$  \*
- D.  $100^\circ$  *thinks  $90^\circ$  angle is acute*

D-M.3.1

44. At 11:00, the hands of a clock form a  $30^\circ$  angle.

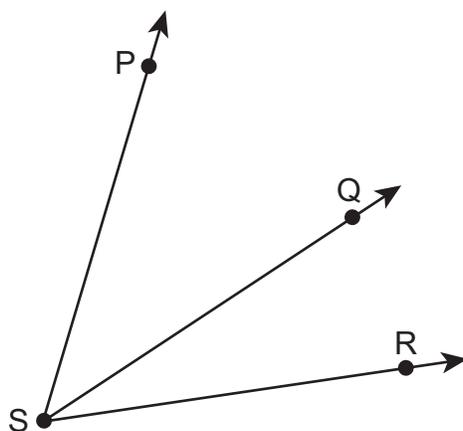


What is the measure of the angle formed by the clock hands at 8:00?

- A.  $60^\circ$  *doubles given angle*
- B.  $90^\circ$  *angle formed by hands pointing to 8 and 11*
- C.  $120^\circ$  \*
- D.  $150^\circ$  *angle formed at 7 o'clock*

## D-M.3.1.2

45. Three cables holding up a pole are shown below.



The angle between cable SQ and cable SR is  $25^\circ$ . The angle between cable SP and cable SR is  $65^\circ$ . What is the measure of the angle between cable SP and cable SQ?

A.  $25^\circ$

*assumes both smaller angles are congruent*

B.  $30^\circ$

*answers by appearance, noting that the larger angle is only slightly larger than QSR*

C.  $40^\circ$

\*

D.  $90^\circ$

*adds the two angle measures together*

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FIRST OPEN-ENDED QUESTION

A-T.2



Question 46  
Page 1 of 2

**?**

**Next**

A school district is ordering supplies for each of the 8 schools in the district.

The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

EQ

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

EQ

**Review/End Test**

**Pause**

**Flag**

**Options**

Question 46  
Page 2 of 2












A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

0 / 1000






**ITEM-SPECIFIC SCORING GUIDELINE**

**Question #46**

**Grade 4**

**Assessment Anchor this item will be reported under:**

M04.A-T.2—Use place-value understanding and properties of operations to perform multi-digit arithmetic.

**Specific Anchor Descriptor addressed by this item:**

M04.A-T.2.1—Use operations to solve problems.

**Scoring Guide:**

Score	In this item, the student –
4	Demonstrates a thorough understanding of the use of place-value understanding and properties of operations to perform multi-digit arithmetic by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of the use of place-value understanding and properties of operations to perform multi-digit arithmetic by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of the use of place-value understanding and properties of operations to perform multi-digit arithmetic by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of the use of place-value understanding and properties of operations to perform multi-digit arithmetic.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-Scorables	B – Blank R – Refusal K – Off task/topic F – Foreign language U – Illegible

**Top Scoring Student Response And Training Notes:**

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of the use of place-value understanding and properties of operations to perform multi-digit arithmetic.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

**Question #46**

**Top Scoring Response:**

Part A Answer	
What?	Why?
10,600 (pencils)	

**(1 score point)**

1 point for correct answer

Part B Answer	
What?	Why?
304 (notebooks)	

**(1 score point)**

1 point for correct answer

Part C Answer	
What?	Why?
5 (boxes)	<p><b>Sample Explanation:</b>                      The school district already has 45 folders, but 45 is not a multiple of 8, so the school district needs to order more folders. Since each box contains 15 folders, the school district needs to order enough folders so that the total number of folders is a multiple of 8 or divisible by 8. This means the district needs to order 5 boxes of folders for a total of <math>5 \times 15 + 45 = 120</math> folders. 120 is a multiple of 8 and 15.</p> <p><b>OR equivalent</b></p>

**(2 score points)**

1 point for correct answer

1 point for correct and complete explanation

FIRST OPEN-ENDED QUESTION RESPONSES

A-T.2 Response Score: 4



Question 46  
Page 1 of 2

Next

A school district is ordering supplies for each of the 8 schools in the district.  
The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

The student has given a correct answer.

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

The student has given a correct answer.

Question 46  
Page 2 of 2

A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

EQ

$45 \div 8 = 5r5$  so each district would get 5 folders but there will be 5 left over which the school district does not want so they have to order more so it will end up even. So how many they order has to be a multiple of 8 but there are 5 extra folders already to also include.  
 $15 \times 1 + 5 = 20$  no  
 $15 \times 2 + 5 = 35$  no  
 $15 \times 3 + 5 = 50$  no  
 $15 \times 4 + 5 = 65$  no  
 $15 \times 5 + 5 = 80$  yes multiple of 8 so 5 boxes more

The student has given a correct answer.  
The student has given a complete explanation.

361 / 1000

Review/End Test

Pause

Flag

Options

Back

A-T.2 Response Score: 3



Question 46  
Page 1 of 2

Next

A school district is ordering supplies for each of the 8 schools in the district. The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

Eq  
10,600 pencils

The student has given a correct answer.

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

Eq  
304 notebooks

The student has given a correct answer.

Review/End Test

Pause

Flag

Options

Question 46  
Page 2 of 2

Back

---

A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

166 / 1000

The student has not given an answer.  
The student has given a complete explanation.

A-T.2 Response Score: 2



Question 46  
Page 1 of 2

Next

A school district is ordering supplies for each of the 8 schools in the district.

The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

$1325 \times 8 = 10,600$

The student has given a correct answer.

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

$2432 \div 8 = 34$

The student has given an incorrect answer.

Options

Flag

Pause

Review/End Test

Question 46  
Page 2 of 2

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A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

Eq

the school has 45 folders and 15 more folders and that is 60 and then they keep adding more and need 5 more boxes

The student has given a correct answer.  
The student has given an incorrect explanation.

113 / 1000

A-T.2 Response Score: 1



Question 46  
Page 1 of 2

A school district is ordering supplies for each of the 8 schools in the district.

The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

Eq

10,600 pencils

The student has given a correct answer.

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

Eq

19,456 notebooks

The student has given an incorrect answer.

Question 46  
Page 2 of 2

A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

?

Eq

$45 \div 15 = 3$   
three more boxes they need to order

42 / 1000

The student has given an incorrect answer.  
The student has given an incorrect explanation.

Back

Review/End Test

Pause

Flag

Options

A-T.2 Response Score: 0



Question 46  
Page 1 of 2

A school district is ordering supplies for each of the 8 schools in the district.

The school district orders a case of pencils for each of the 8 schools. Each case contains 1,325 pencils.

**A.** How many pencils does the school district order in all?

The student has given an incorrect answer.

The school district also orders 2,432 notebooks. They plan to distribute the notebooks equally to each of the 8 schools.

**B.** How many notebooks should each of the 8 schools receive?

The student has given an incorrect answer.

Question 46  
Page 2 of 2

Back

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A school district is ordering supplies for each of the 8 schools in the district.

The school district has 45 folders remaining from last school year. The school district will distribute the same number of folders to each of the 8 schools but does not want any extra folders remaining. If necessary, the school district can purchase more folders so each school receives the same number of folders. New folders are purchased in boxes. There are 15 folders in each box.

**C.** Explain why the school district will need to order more boxes of folders. As part of your explanation, determine the **least** number of boxes the school district can order so each of the 8 schools receives the same number of folders.

Eq

45+8+15=68 folders in each box

The student has given an incorrect answer.  
The student has given an incorrect explanation.

30 / 1000

Review/End Test

Pause

Flag

Options

**SECOND OPEN-ENDED QUESTION****A-F.2.1****47.** Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

**A.** What fraction of a quart of water was in the bowl before Paige added water to it?

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

**B.** Paige is feeding her dog more food now than before. Show or explain why this is true.

**Go to the next page to finish question 47.**

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}.$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

**ITEM-SPECIFIC SCORING GUIDELINE**

**Question #47**

**Grade 4**

**Assessment Anchor this item will be reported under:**

M04.A-F.2—Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

**Specific Anchor Descriptor addressed by this item:**

M04.A-F.2.1—Solve problems involving fractions and whole numbers (straight computation or word problems).

**Scoring Guide:**

Score	In this item, the student –
4	Demonstrates a thorough understanding of how to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of how to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of how to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of how to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-Scorables	B – Blank R – Refusal K – Off task/topic F – Foreign language U – Illegible

**Top Scoring Student Response And Training Notes:**

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of how to build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

**Question #47**

**Top Scoring Response:**

Part A Answer	
What?	Why?
$\frac{6}{8}$ (quart) <b>OR equivalent</b>	

**(1 score point)**

1 point for correct answer

Part B Answer	
What?	Why?
	<p><b>Sample Explanation:</b></p> $\frac{1}{3} = \frac{4}{12}$ $\frac{1}{4} = \frac{3}{12}$ $\frac{4}{12} > \frac{3}{12}, \text{ so } \frac{1}{3} > \frac{1}{4}$ <p><b>OR</b></p> <p><b>Sample Explanation:</b></p> <p>Since the top numbers in both fractions are 1, then the fraction with the smaller bottom number is the greater number. So <math>\frac{1}{3} &gt; \frac{1}{4}</math> so Paige is feeding her dog more food now than before.</p> <p><b>OR equivalent</b></p>

**(1 score point)**

1 point for correct and complete support

OR ½ point for correct but incomplete support

Part C Answer	
What?	Why?
$\frac{2}{3}$ (cup)	<p><b>Sample Explanation:</b></p> <p>When Paige multiplied <math>\frac{1}{3}</math> by 2, she multiplied both the numerator and the denominator by 2. She should have only multiplied the numerator by 2. The new dog will eat <math>\frac{2}{3}</math> cup of food at each meal.</p> <p><b>OR equivalent</b></p>

**(2 score points)**

1 point for correct answer

1 point for correct and complete explanation

OR ½ point for correct but incomplete explanation

## SECOND OPEN-ENDED QUESTION RESPONSES

## A-F.2.1 Response Score: 4

47. Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

A. What fraction of a quart of water was in the bowl before Paige added water to it?

$$\frac{7}{8} - \frac{1}{8} = \boxed{\frac{6}{8}}$$

The student has given a correct answer.

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

B. Paige is feeding her dog more food now than before. Show or explain why this is true.

$$\frac{1}{4} \times 3 = \frac{3}{12} \qquad \frac{4}{12} > \frac{3}{12}$$

$$\frac{1}{3} \times 4 = \frac{4}{12} \qquad \frac{1}{3} > \frac{1}{4}$$

The student has shown complete support.

Go to the next page to finish question 47.

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

Paige didn't really double  $\frac{1}{3}$  because she multiplied both the numerator and the denominator by 2 so she really just made an equivalent fraction. If she wants to double the food for the new dog she needs to multiply just the numerator by 2 so the food will be  $\frac{2}{3}$  not  $\frac{2}{6}$ .

The student has given a correct answer.  
The student has given a complete explanation.

## A-F.2.1 Response Score: 3

47. Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

A. What fraction of a quart of water was in the bowl before Paige added water to it?

$\frac{6}{8}$  quart

$\frac{3}{4}$  quart

The student has given a correct answer.

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

B. Paige is feeding her dog more food now than before. Show or explain why this is true.

$\frac{1}{4}$  is less than  $\frac{1}{3}$  because  
4 is bigger than 3 and the  
top numbers are both one

The student has shown complete support.

Go to the next page to finish question 47.

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}.$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

$\frac{1}{3}$  and  $\frac{2}{6}$  are the same amount. Paige should feed her new dog  $\frac{2}{3}$  cup.

The student has given a correct answer.  
The student has given an incorrect explanation.

## A-F.2.1 Response Score: 2

47. Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

A. What fraction of a quart of water was in the bowl before Paige added water to it?

$$\frac{8}{8}$$

The student has given an incorrect answer.

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

B. Paige is feeding her dog more food now than before. Show or explain why this is true.

Because  $\frac{1}{3} > \frac{1}{4}$

The student has shown correct but incomplete support.

Go to the next page to finish question 47.

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}.$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

Paige did not multiply the top number right so she didn't get  $\frac{2}{3}$  she got  $\frac{2}{6}$ .

The student has given a correct answer.

The student has given a correct but incomplete explanation.

## A-F.2.1 Response Score: 1

47. Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

A. What fraction of a quart of water was in the bowl before Paige added water to it?

$$\frac{7}{8} - \frac{1}{8} = \frac{6}{8}$$

The student has given a correct answer.

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

B. Paige is feeding her dog more food now than before. Show or explain why this is true.

$$\frac{1}{4} + \frac{1}{3} = \frac{1}{7} \quad \text{and that is bigger}$$

The student has shown incorrect support.

Go to the next page to finish question 47.

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

She should have added

$$\frac{1}{3} + 2 = \frac{1+2}{3+2} = \frac{3}{5} \quad \text{the puppy should eat}$$

The student has given an incorrect answer.  
The student has given an incorrect explanation.

## A-F.2.1 Response Score: 0

47. Paige measures and records how much her dog eats and drinks.

Paige adds  $\frac{1}{8}$  quart of water to her dog's water bowl. The bowl already had water in it. After Paige is done pouring water into the bowl, the total amount of water in the bowl is  $\frac{7}{8}$  quart of water.

A. What fraction of a quart of water was in the bowl before Paige added water to it?

$\frac{7}{8}$  quart

The student has given an incorrect answer.

Paige feeds her dog  $\frac{1}{4}$  cup of food at each meal. She decides to change to a new kind of dog food. For her dog to get the same amount of nutrition from the new dog food as the old dog food, Paige needs to feed her dog  $\frac{1}{3}$  cup of the new dog food at each meal.

B. Paige is feeding her dog more food now than before. Show or explain why this is true.

The new dog is a puppy and he eats more food.

The student has shown incorrect support.

Go to the next page to finish question 47.

47. **Continued.** Please refer to the previous page for task explanation.

Paige gets a second dog. At each meal, the new dog needs to eat 2 times more food than her first dog. She knows her first dog eats  $\frac{1}{3}$  cup of food at each meal.

Paige claims that her new dog needs to eat  $\frac{2}{6}$  cup of food at each meal since

$$\frac{1}{3} \times 2 = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}.$$

- C. Explain the mistake Paige made when calculating the amount of food the new dog needs to eat at each meal. As part of your answer, state how much food the new dog should actually eat at each meal.

The new dog will eat more than the other dog. He eats 2 times more

The student has given an incorrect answer.  
The student has given an incorrect explanation.

THIRD OPEN-ENDED QUESTION

B-O.1



Question 48

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**Review/End Test**

Joanie is counting her art supplies.

She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

EQ

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

EQ

Question 48

Page 2 of 2

Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

**C.** What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

0 / 1000

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

**D.** How many more crayons does Joanie need? Show or explain all your work.

0 / 1000

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**ITEM-SPECIFIC SCORING GUIDELINE**

**Question #48**

**Grade 4**

**Assessment Anchor this item will be reported under:**

M04.B-O.1—Use the four operations with whole numbers to solve problems.

**Specific Anchor Descriptor addressed by this item:**

M04.B-O.1.1—Use numbers and symbols to model the concepts of expressions and equations.

**Scoring Guide:**

Score	In this item, the student –
4	Demonstrates a thorough understanding of using the four operations with whole numbers by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of using the four operations with whole numbers by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of using the four operations with whole numbers by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of using the four operations with whole numbers.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-Scorables	B – Blank R – Refusal K – Off task/topic F – Foreign language U – Illegible

**Top Scoring Student Response And Training Notes:**

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of using the four operations with whole numbers.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

**Question #48**

**Top Scoring Response:**

Part A Answer	
What?	Why?
8 (paint brushes)	

**(½ score point)**

½ point for correct answer

Part B Answer	
What?	Why?
$44 = 2 \times m + 16$ <b>OR equivalent</b>	

**(½ score point)**

½ point for correct answer

Part C Answer	
What?	Why?
15 (crayons)	<b>Sample Work:</b> $127 \div 8 = 15 \text{ R}7$ <b>OR</b> <b>Sample Explanation:</b> Joanie can put up to 15 crayons into each box. This would leave her with 7 extra crayons, which is not enough to put 1 more into each box.

**(1½ score points)**

½ point for correct answer

1 point for complete support

OR ½ point for correct but incomplete support

Part D Answer	
What?	Why?
38 (crayons) [Note: Carry over any error from Part C]	<b>Sample Work:</b> $8 + 3 = 11$ $11 \times 15 = 165$ $165 - 127 = 38$ <b>OR</b> <b>Sample Explanation:</b> To fill 3 more boxes with the same number of crayons, Joanie would need $3 \times 15 = 45$ extra crayons. Since she already has 7 crayons remaining from the 127, Joanie would need only 38 more crayons to fill the 3 boxes.

**(1½ score points)**

½ point for correct answer

1 point for complete support

OR ½ point for correct but incomplete support

THIRD OPEN-ENDED QUESTION RESPONSES

B-O.1 Response Score: 4



Question 48  
Page 1 of 2

Joanie is counting her art supplies.  
She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

Eq

The student has given a correct answer.

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

Eq

The student has given a correct answer.

Review/End Test

Exit

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Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

C. What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

Eq

127 ÷ 8 = 15 with a remainder of 7  
So 15 is the most because then there are only 7 left so not enough for all the boxes

114 / 1000

The student has given a correct answer.  
The student has shown complete support.

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

D. How many more crayons does Joanie need? Show or explain all your work.

Eq

3 x 15 = 45  
She has 7 left already  
45 - 7 = 38  
So 38 more

57 / 1000

The student has given a correct answer.  
The student has shown complete support.



B-O.1 Response Score: 3



Question 48

Page 1 of 2

Joanie is counting her art supplies.

She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

Eq
32 ÷ 4 = 8

The student has given a correct answer.

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

Eq
 $m = 44 + 16 \times 2$

The student has given an incorrect answer.

**Review/End Test**

**Exit**

**Flag**

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Question 48  
Page 2 of 2



Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

C. What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

EQ

127 ÷ 8 = 15 and there are 7 left

28 / 1000

The student has given a correct answer.  
The student has shown complete support.

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

D. How many more crayons does Joanie need? Show or explain all your work.

EQ

127 now  
127 + 15 + 15 + 15 = 172  
172 - 7 = 165  
165 - 127 = 35

61 / 1000

The student has given an incorrect answer due to a calculation error.  
The student has shown complete support.

Review/End Test

Exit

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B-O.1 Response Score: 2



Question 48

Page 1 of 2

Joanie is counting her art supplies.

She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

Eq

The student has given a correct answer.

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

Eq

The student has given an incorrect answer.

**Review/End Test**

**Exit**

**Flag**

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Question 48  
Page 2 of 2



Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

**C.** What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

EQ

I think 15 cuz  $127 \div 8 = 15$

23 / 1000

The student has given a correct answer.  
The student has shown correct but incomplete support.

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

**D.** How many more crayons does Joanie need? Show or explain all your work.

EQ

I think 38 cuz she needs that many more

39 / 1000

The student has given a correct answer.

Review/End Test

Exit

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Navigation icons: Home, Play, Stop, Back

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B-O.1 Response Score: 1



Question 48

Page 1 of 2

Joanie is counting her art supplies.

She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

Eq

The student has given a correct answer.

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

Eq

The student has given an incorrect answer.

**Review/End Test**

**Exit**

**Flag**

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Question 48  
Page 2 of 2



Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

C. What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

Eq


184 / 1000

The student has given an incorrect answer.

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

D. How many more crayons does Joanie need? Show or explain all your work.

Eq

--

3 / 1000

The student has given an incorrect answer.



B-O.1 Response Score: 0



Question 48

Page 1 of 2

Joanie is counting her art supplies.

She has 32 bottles of paint. That is 4 times the number of paint brushes she has.

**A.** How many paint brushes does Joanie have?

Eq

The student has given an incorrect answer.

Joanie has a total of 44 markers. She has 1 pack that has 16 markers in it. She has 2 packs that each have  $m$  markers.

**B.** Write a number sentence that can be used to find  $m$ .

Eq

The student has given an incorrect answer.

**Review/End Test**

**Exit**

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Question 48

Page 2 of 2

Joanie has 127 crayons. She equally divides as many of her crayons as possible into 8 boxes.

**C.** What is the **greatest** number of crayons Joanie can put into each box? Show or explain all your work.

EQ

$127 \div 8 = 135$

9 / 1000

The student has given an incorrect answer.  
The student has shown incorrect support.

Joanie wants to fill 3 more boxes with the same number of crayons as determined in **part C**.

**D.** How many more crayons does Joanie need? Show or explain all your work.

EQ

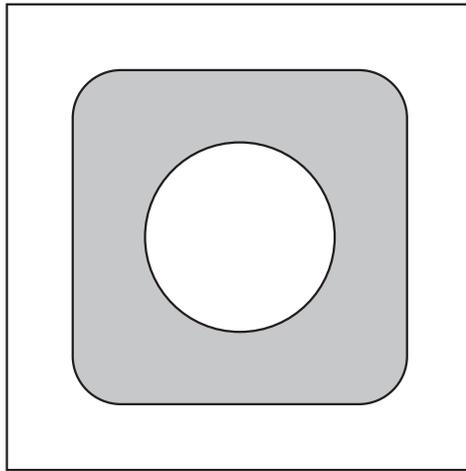
3

1 / 1000

The student has given an incorrect answer.  
The student has shown no support.

**FOURTH OPEN-ENDED QUESTION****C-G.1****49.** A square flag is shown below.

- A.** On the flag shown below, draw two lines of symmetry that are perpendicular to each other.

**Flag**

- B.** Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

**Go to the next page to finish question 49.**

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

**ITEM-SPECIFIC SCORING GUIDELINE**

**Question #49**

**Grade 4**

**Assessment Anchor this item will be reported under:**

M04.C-G.1—Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

**Specific Anchor Descriptor addressed by this item:**

M04.C-G.1.1—List properties, classify, draw, and identify geometric figures in two dimensions.

**Scoring Guide:**

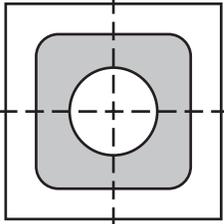
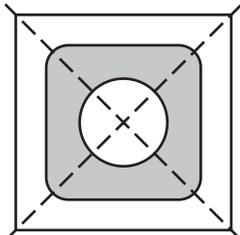
Score	In this item, the student –
4	Demonstrates a thorough understanding of drawing and identifying lines and classifying shapes by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of drawing and identifying lines and classifying shapes by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of drawing and identifying lines and classifying shapes by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of drawing and identifying lines and classifying shapes.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-Scorables	B – Blank R – Refusal K – Off task/topic F – Foreign language U – Illegible

**Top Scoring Student Response And Training Notes:**

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of drawing and identifying lines and classifying shapes.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Question #49

Top Scoring Response:

Part A Answer	
What?	Why?
<p style="text-align: center;"><b>Flag</b></p>  <p style="text-align: center;"><b>Flag</b></p>  <p style="text-align: center;">OR</p>	

(1 score point)

1 point for correct answer

OR ½ point for incomplete response (only 1 line drawn, or lines of symmetry are not perpendicular, or lines are perpendicular but are not lines of symmetry)

Part B Answer	
What?	Why?
	<p><b>Sample Explanation:</b> Each half of the flag on either side of the line of symmetry is the same.</p>

(1 score point)

1 point for complete explanation

OR ½ point for correct but incomplete explanation

Part C Answer	
What?	Why?
	<p><b>Sample Explanation:</b> The two lines intersect to make a right angle, like the corner of a square.</p>

(1 score point)

1 point for complete explanation

OR ½ point for correct but incomplete explanation

Part D Answer	
What?	Why?
	<p><b>Sample Explanation:</b> A line of symmetry has to divide the shape into two halves that are the same. A line parallel to a line of symmetry can't divide the shape into two halves that are the same without being in the same place as the first line.</p>

(1 score point)

1 point for complete explanation

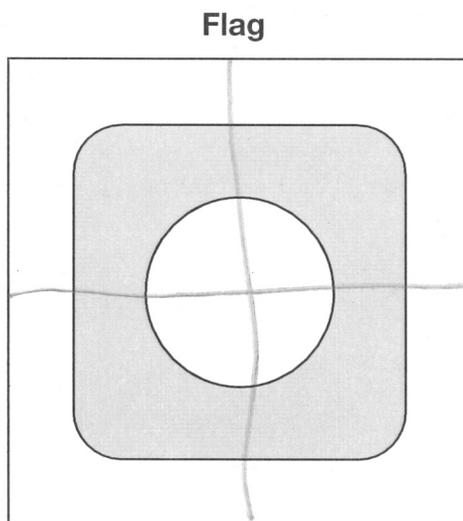
OR ½ point for correct but incomplete explanation

## FOURTH OPEN-ENDED QUESTION RESPONSES

C-G.1 Response Score: 4

49. A square flag is shown below.

A. On the flag shown below, draw two lines of symmetry that are perpendicular to each other.



The student has given a correct answer.

B. Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

when you fold them on the lines they are exactly the same on both sides.

The student has given a complete explanation.

Go to the next page to finish question 49.

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

where they cross there are right angles.

The student has given a complete explanation.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

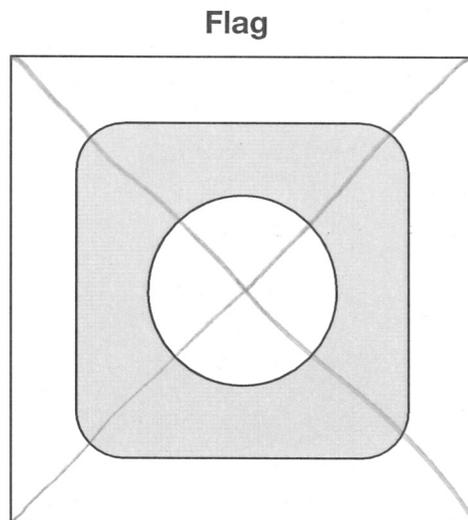
A line of symmetry divides into 2 halves that are just exactly alike so if a line is parallel it won't be in the same exact place as the first line so the halves won't be the same any more.

The student has given a complete explanation.

## C-G.1 Response Score: 3

49. A square flag is shown below.

- A. On the flag shown below, draw two lines of symmetry that are perpendicular to each other.



The student has given a correct answer.

- B. Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

*The 2 halves are exactly the same on both sides.*

The student has given a complete explanation.

Go to the next page to finish question 49.

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

They cross each other

The student has given a correct but incomplete explanation.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

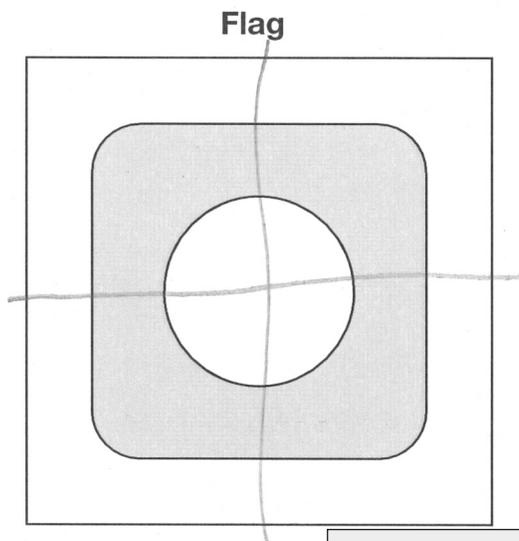
The lines would have to be on top of each other so the two halves would be the same so then they would not be two different lines that would be parallel.

The student has given a complete explanation.

## C-G.1 Response Score: 2

49. A square flag is shown below.

- A. On the flag shown below, draw two lines of symmetry that are perpendicular to each other.



The student has given a correct answer.

- B. Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

Both sides of the lines are the same. When you fold them everything matches.

The student has given a complete explanation.

Go to the next page to finish question 49.

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

They make squares

The student has given a correct but incomplete explanation.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

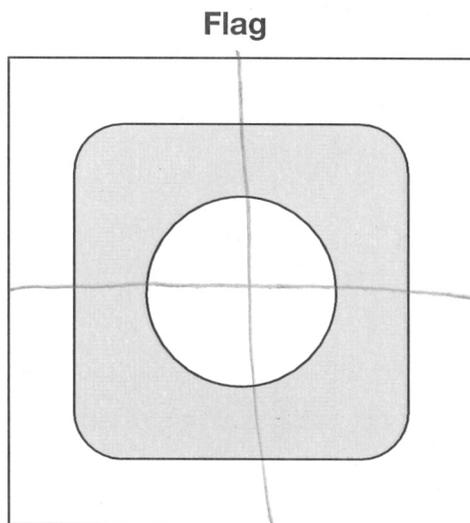
they would not be lines of symmetry.

The student has given an insufficient explanation.

## C-G.1 Response Score: 1

49. A square flag is shown below.

- A. On the flag shown below, draw two lines of symmetry that are perpendicular to each other.



The student has given a correct answer.

- B. Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

they are the same.

The student has given an insufficient explanation.

Go to the next page to finish question 49.

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

they are like a flag.

The student has given an incorrect explanation.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

they are next to each other.

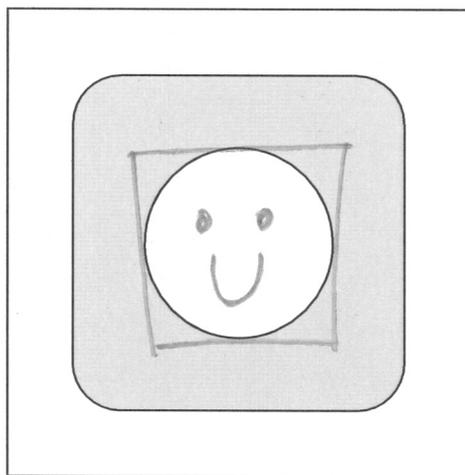
The student has given an incorrect explanation.

C-G.1 Response Score: 0

49. A square flag is shown below.

A. On the flag shown below, draw two lines of symmetry that are perpendicular to each other.

Flag



The student has given an incorrect answer.

B. Explain how someone could know that the lines you drew in **part A** are lines of symmetry.

They have symmetry

The student has given an incorrect explanation.

Go to the next page to finish question 49.

49. **Continued.** Please refer to the previous page for task explanation.

C. Explain how someone could know that the lines you drew in **part A** are perpendicular to each other.

they are perpendicular

The student has given an incorrect explanation.

D. Explain why it is **not** possible to draw two different lines of symmetry that are parallel to each other.

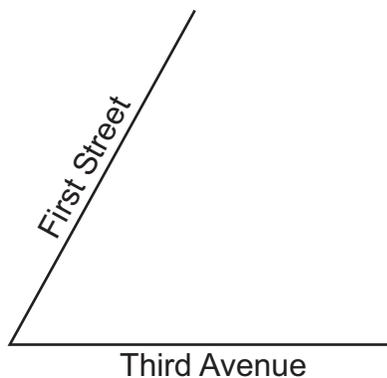
they are parallel

The student has given an incorrect explanation.

**FIFTH OPEN-ENDED QUESTION****D-M.3**

50. Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



- A.** Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is  $115^\circ$ .

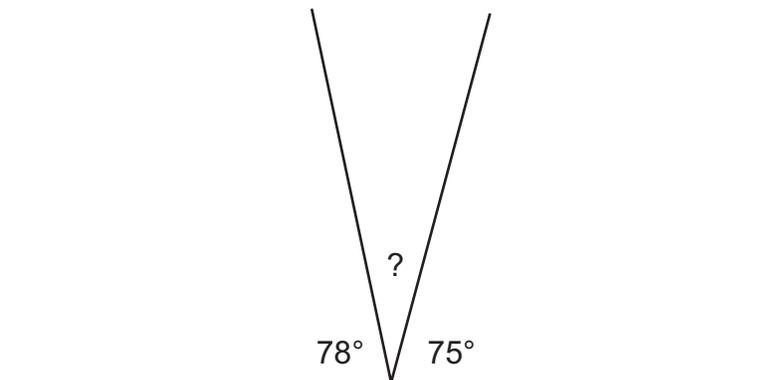
- B.** Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.



**Go to the next page to finish question 50.**

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

- C.** Explain the error Liban made.

- D.** What is the measure, in degrees, of the middle angle?

**ITEM-SPECIFIC SCORING GUIDELINE**

**Question #50**

**Grade 4**

**Assessment Anchor this item will be reported under:**

M04.D-M.3–Geometric measurement: understand concepts of angles and measure angles

**Specific Anchor Descriptor addressed by this item:**

M04.D-M.3.1–Use appropriate tools and units to sketch an angle and determine angle measurements.

**Scoring Guide:**

Score	In this item, the student –
4	Demonstrates a thorough understanding of angle concepts and the ability to measure angles by correctly solving problems and clearly explaining procedures.
3	Demonstrates a general understanding of angle concepts and the ability to measure angles by correctly solving problems and clearly explaining procedures with only minor errors or omissions.
2	Demonstrates a partial understanding of angle concepts and the ability to measure angles by correctly performing a significant portion of the required task.
1	Demonstrates minimal understanding of angle concepts and the ability to measure angles.
0	The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task. Response may show only information copied from the question.
Non-Scorables	B – Blank R – Refusal K – Off task/topic F – Foreign language U – Illegible

**Top Scoring Student Response And Training Notes:**

Score	Description
4	Student earns 4 points.
3	Student earns 3.0 – 3.5 points.
2	Student earns 2.0 – 2.5 points.
1	Student earns 0.5 – 1.5 points. OR Student demonstrates minimal understanding of angle concepts and the ability to measure angles.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

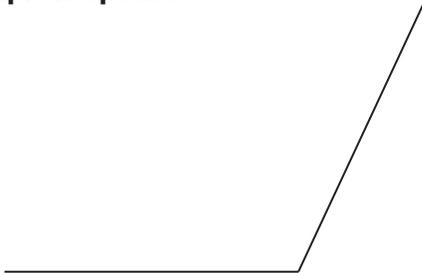
**Question #50**

**Top Scoring Response:**

Part A Answer	
What?	Why?
61°	

**(1 score point)**

1 point for correct answer

Part B Answer	
What?	Why?
<p>Answers may vary. Accept any angle that measures between (and including) 113° and 117°.</p> <p><b>Sample Response:</b></p> 	

**(1 score point)**

1 point for correct answer

Part C Answer	
What?	Why?
	<p><b>Sample Explanation:</b>                      Liban should have subtracted 75° from 180° instead of adding it.  <b>OR</b>                      Liban should have set up his problem like <math>78^\circ + ? + 75^\circ = 180^\circ</math>.</p>

**(1 score point)**

1 point for complete support

Part D Answer	
What?	Why?
27°	

**(1 score point)**

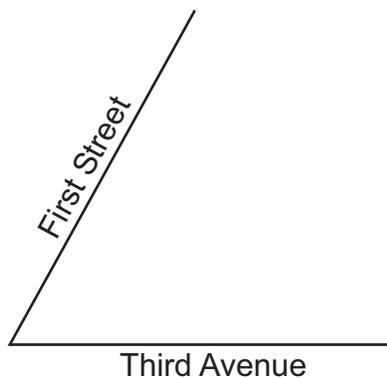
1 point for correct answer

**FIFTH OPEN-ENDED QUESTION RESPONSES**

**D-M.3 Response Score: 4**

**50.** Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



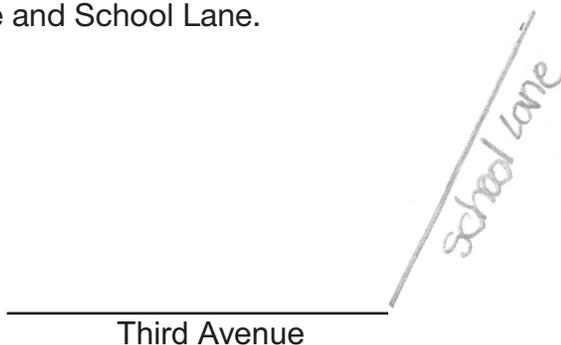
**A.** Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

61°

The student has given a correct answer.

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is 115°.

**B.** Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.

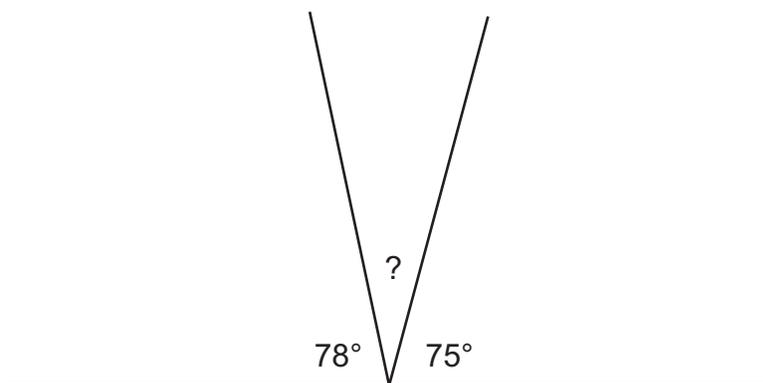


The student has given a correct answer.

**Go to the next page to finish question 50.**

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

- C. Explain the error Liban made.

he should have subtracted instead he added 75. It should be  $180 - 78 - 75 = 27$

The student has given a complete explanation.

- D. What is the measure, in degrees, of the middle angle?

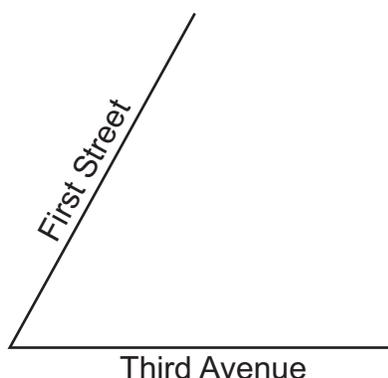
27°

The student has given a correct answer.

D-M.3 Response Score: 3

50. Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



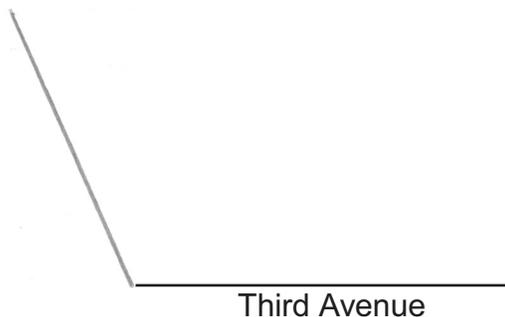
A. Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

69°

The student has given an incorrect answer.

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is  $115^\circ$ .

B. Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.

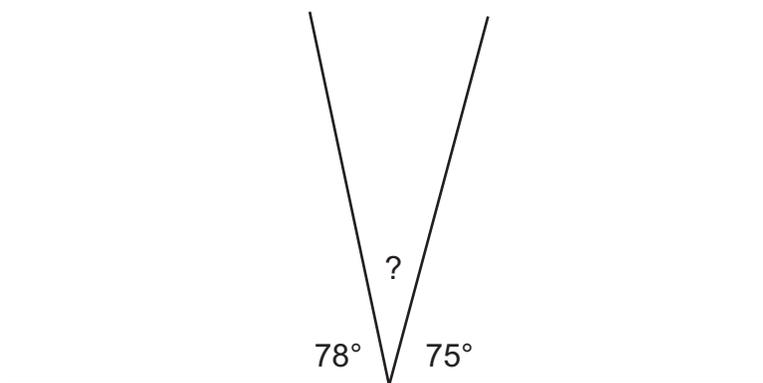


The student has given a correct answer.

Go to the next page to finish question 50.

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

- C. Explain the error Liban made.

*He did add  $75^\circ$  instead of subtract it.*

The student has given a correct explanation.

- D. What is the measure, in degrees, of the middle angle?

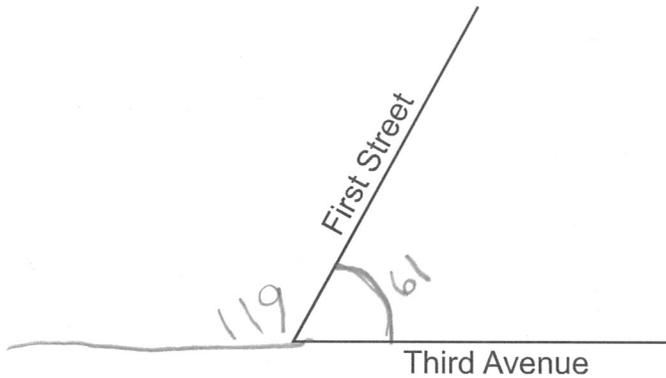
$$180 - 78 - 75 = 27^\circ$$

The student has given a correct answer.

D-M.3 Response Score: 2

50. Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



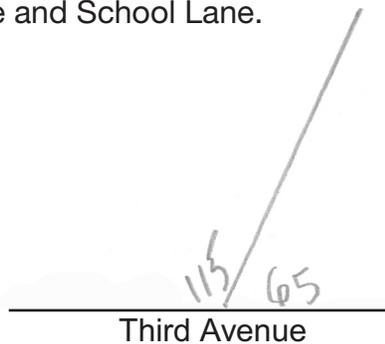
A. Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

61

The student has given a correct answer.

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is  $115^\circ$ .

B. Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.

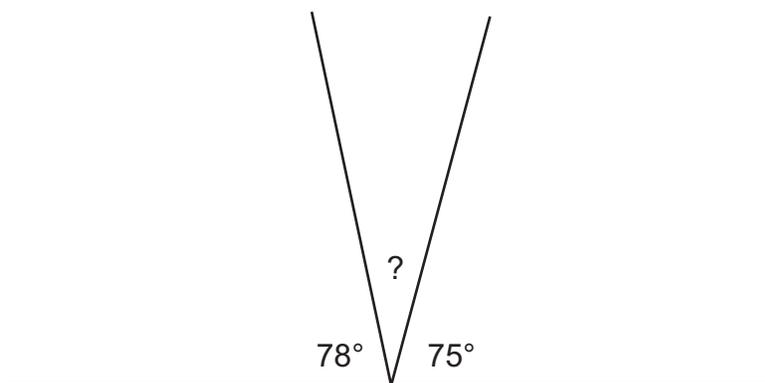


The student has given a correct answer.

Go to the next page to finish question 50.

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

C. Explain the error Liban made.

It should be  $180^\circ$

The student has given an incorrect explanation.

D. What is the measure, in degrees, of the middle angle?

$180^\circ$

The student has given an incorrect answer.

D-M.3 Response Score: 1

50. Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



A. Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

The student has given an incorrect answer.

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is  $115^\circ$ .

B. Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.

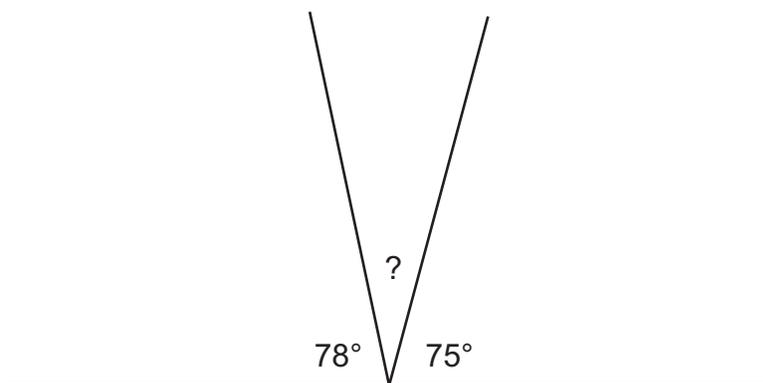


The student has given an incorrect answer.

Go to the next page to finish question 50.

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

- C. Explain the error Liban made.

HE DIDN'T MEASURE  
IT RIGHT

The student has given an incorrect explanation.

- D. What is the measure, in degrees, of the middle angle?

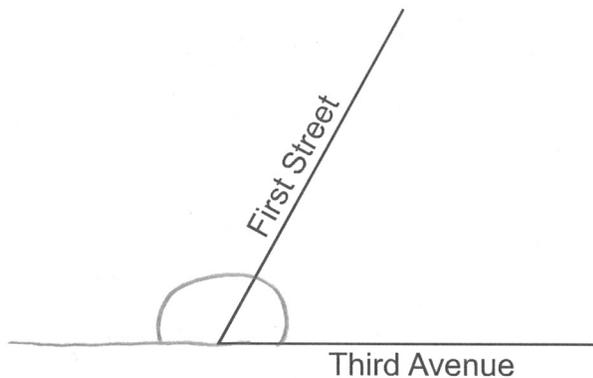
27°

The student has given a correct answer.

D-M.3 Response Score: 0

50. Every day, Liban walks the same route to school.

The diagram below shows a part of the route he walks.



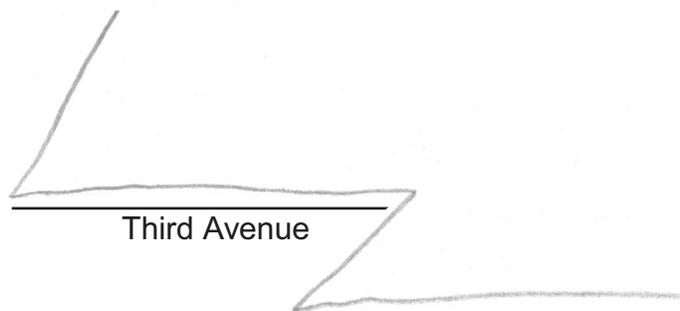
A. Using your protractor, what is the measure of the angle, in degrees, created by First Street and Third Avenue?

120

The student has given an incorrect answer.

As Liban continues his route, Third Avenue meets School Lane. The angle created by Third Avenue and School Lane is  $115^\circ$ .

B. Using your protractor and the line segment shown below, draw the angle created by Third Avenue and School Lane.

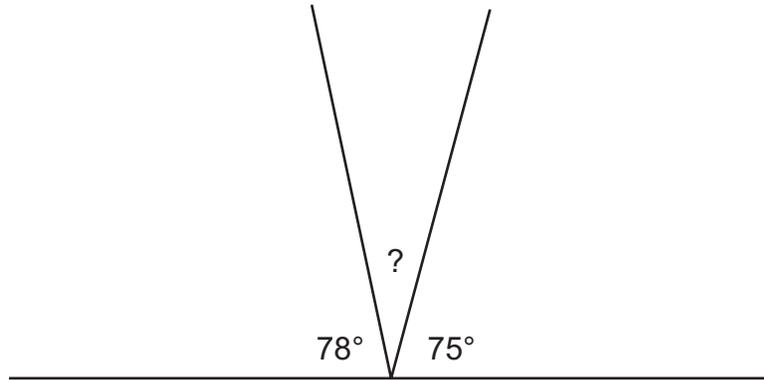


The student has given an incorrect answer.

Go to the next page to finish question 50.

50. **Continued.** Please refer to the previous page for task explanation.

On Friday, Liban walked to the park after school. When he looked at the playground, he noticed many different angles, including the ones shown below.



Combined, the three angles have a measure of  $180^\circ$ . Liban tried to find the measure of the middle angle using the work shown below.

$$180^\circ - 78^\circ + 75^\circ = ?$$

$$177^\circ = ?$$

Liban's answer is not correct.

- C. Explain the error Liban made.

He didnt know how to subtract  
and add

The student has given an incorrect explanation.

- D. What is the measure, in degrees, of the middle angle?

$$78 + 75 = 153$$

The student has given an incorrect answer.

# **PSSA Grade 4 Mathematics Item and Scoring Sampler**

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