New York NYSTP 2022 Grade 4 Math

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Name: _____

New York State Testing Program

2022 Mathematics Test Session 1

Grade 4

April 26–28, 2022

RELEASED QUESTIONS

Session 1

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice.
- You have been provided with mathematics tools (a ruler and a protractor) to use during the test. It is up to you to decide when each tool will be helpful. You should use mathematics tools whenever you think they will help you to answer the question.

1 Julia moves the arm of a spinner one degree at a time 45 times. How many total degrees does Julia move the arm of the spinner?

A 1

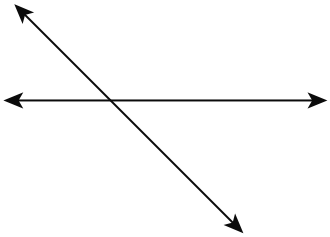
B 45

C 90

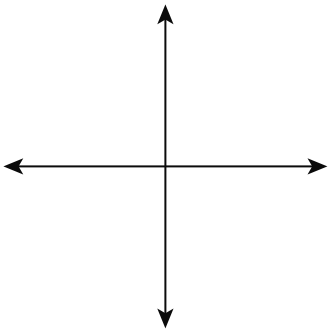
D 360

2 Which pair of lines appears to be perpendicular?

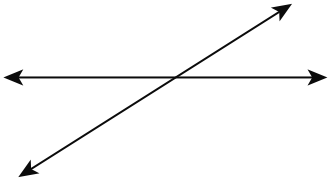
A



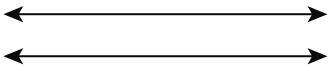
C



B



D



8 The ground in a rectangular section of a park has a length of 24 feet and a width of 12 feet. What is the area, in square feet, of the ground in that section of the park?

A 36

B 72

C 144

D 288

9 How many times greater is the value represented by the digit 6 in the number 6,419 than the value represented by the digit 6 in the number 84,362 ?

A 10

B 100

C 1,000

D 10,000

13 Which equation represents the statement below?

forty-eight is six times as many as eight

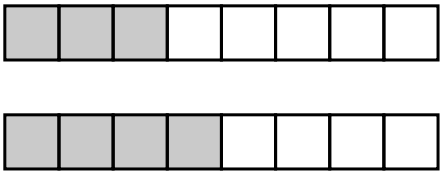
A $48 - 6 = 8$

B $48 + 6 = 8$

C $48 = 6 \times 8$

D $48 = 6 + 8$

14 The models below are each shaded to represent a different fraction.



What is the sum of the fractions represented by the shaded parts of the models?

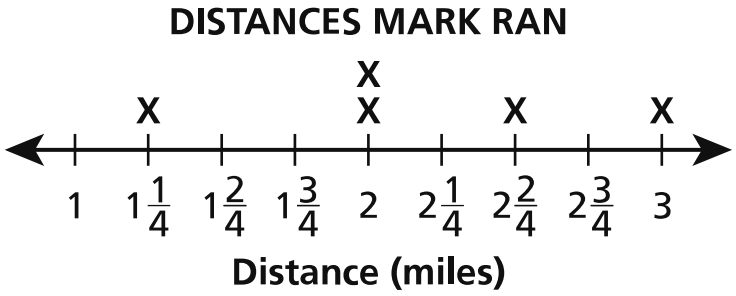
A $\frac{1}{8}$

B $\frac{3}{8}$

C $\frac{4}{8}$

D $\frac{7}{8}$

16 The line plot below shows the distances Mark ran on each of five days last week.



What is the total number of miles Mark ran last week?

A $8\frac{1}{4}$

B $8\frac{3}{4}$

C $10\frac{2}{4}$

D $10\frac{3}{4}$

17 A number rounded to the nearest hundred is 3,700. Which number could **not** be the number before it was rounded?

A 3,614

B 3,650

C 3,720

D 3,749

21 Which list shows only fractions less than $\frac{1}{2}$?

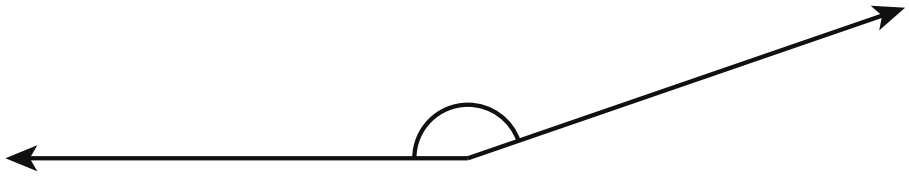
A $\frac{1}{3}, \frac{1}{5}, \frac{1}{8}$

B $\frac{2}{3}, \frac{2}{4}, \frac{2}{5}$

C $\frac{1}{4}, \frac{5}{8}, \frac{6}{12}$

D $\frac{3}{4}, \frac{5}{6}, \frac{7}{10}$

22 What is the measure of the angle shown below?



A 19°

B 24°

C 156°

D 161°

23 Brownies are sold at a bake sale.

- 3 pans of brownies are for sale
- each pan has 5 rows with 5 brownies in each row
- each brownie is sold for $2

How much money is made when all of the brownies are sold?

A $25

B $50

C $75

D $150

24 What is the measure, in degrees, of an angle that represents $\frac{1}{4}$ of a complete circle?

A 25

B 45

C 90

D 180

GO ON

27 What is the value of $7,839 \times 9$?

A $70,471$

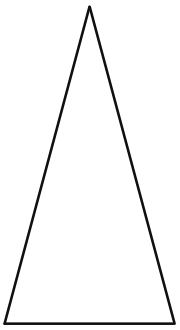
B $70,551$

C $71,471$

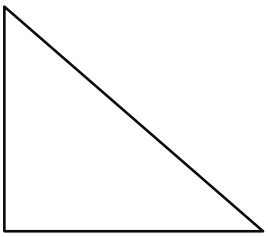
D $71,551$

28 Which figure appears to be a right triangle?

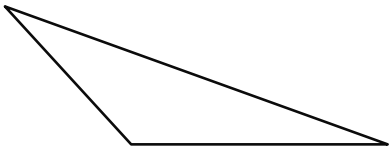
A



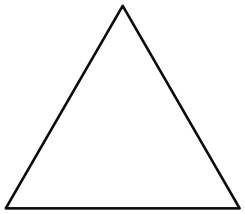
C



B



D



Session 2

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice or writing your response.
- You have been provided with mathematics tools (a ruler and a protractor) to use during the test. It is up to you to decide when each tool will be helpful. You should use mathematics tools whenever you think they will help you to answer the question.
- Be sure to show your work when asked.

31 Mr. Jonus ordered a pizza to take home. His children ate $\frac{4}{8}$ of the pizza and Mr. Jonus ate $\frac{2}{8}$ of the pizza. The remaining pizza was saved for later. Which equation could be used to represent the whole pizza?

A $\frac{2}{8} + \frac{3}{8} + \frac{4}{8} = 1$

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

C $\frac{2}{8} + \frac{2}{8} + \frac{4}{8} = 1$

D $\frac{2}{8} + \frac{4}{8} + \frac{4}{8} = 1$

32 Matt has 4 pens. Sue has 4 times as many pens as Matt. Chris has 2 times as many pens as Sue. Which equation can be used to determine the number of pens Chris has?

A $4 + 4 + 2 = \underline{\ ?\ }$

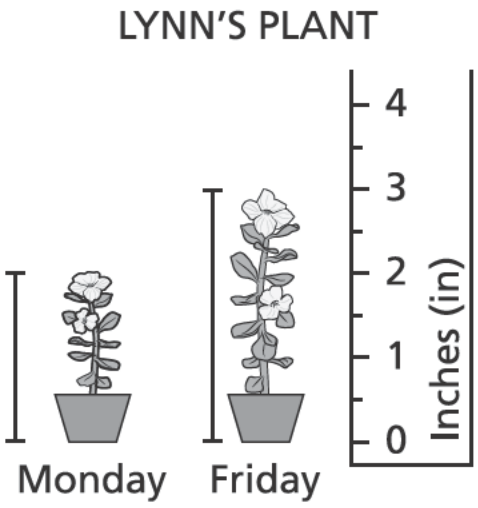
B $4 + 4 \times 2 = \underline{\ ?\ }$

C $4 \times 4 \times 2 = \underline{\ ?\ }$

D $4 \times 4 + 2 = \underline{\ ?\ }$

GO ON

33 Lynn measured the height of a plant on Monday and again on Friday. The diagram below shows the plant's height, in inches, on each day.



How much did the plant grow, in inches, between Monday and Friday?

A 1

B 2

C 3

D 5

34 Sam has 12 baseball cards. Aly has 4 times as many baseball cards as Sam. Which equation can be used to find the total number of baseball cards Aly has?

A $12 \div 4 = 3$

B $12 - 4 = 8$

C $12 + 4 = 16$

D $12 \times 4 = 48$

35 What is the value of the expression shown below?

$$9\frac{4}{10} - 2\frac{8}{10}$$

A $6\frac{4}{10}$

B $6\frac{6}{10}$

C $7\frac{4}{10}$

D $7\frac{6}{10}$

36 Cam has 35 tickets to use at an amusement park. He wants to use as many of the tickets on rides as he can. Each ride requires 4 tickets. How many tickets will Cam have left over after going on as many rides as he can?

A 3

B 4

C 8

D 9

37 The students in Ms. Lee's class collected 268 books to donate to a library. The books were packed into 4 large boxes. The same number of books were packed in each box. How many books were packed in each box?

A 52

B 67

C 842

D 1,072

38 There are 24 students in Ms. Smyth's fourth-grade class. There are 6 times as many fourth-grade students in the school as in Ms. Smyth's class. Which equation can be used to find the total number of fourth-grade students in the school?

A $24 \times \_?\_ = 6$

B $24 \div \_?\_ = 6$

C $24 \times 6 = \_?\_$

D $24 + 6 = \_?\_$

39 The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

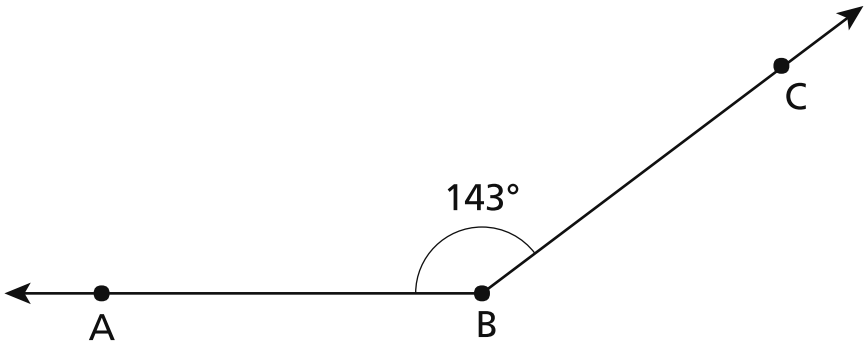
If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

Answer _____ tickets

GO ON

40 The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD. What is the measure, in degrees, of angle CBD ?

Show your work.

Answer _____ degrees

41 Dotted lines were added to the two figures shown below to represent lines of symmetry.

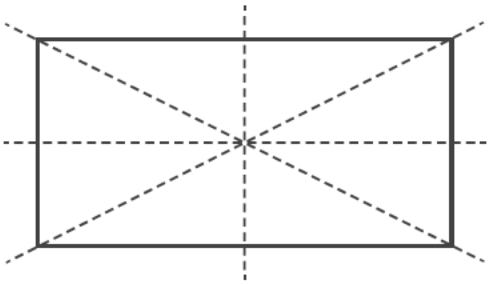


Figure A

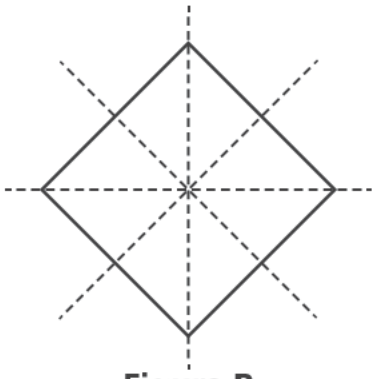


Figure B

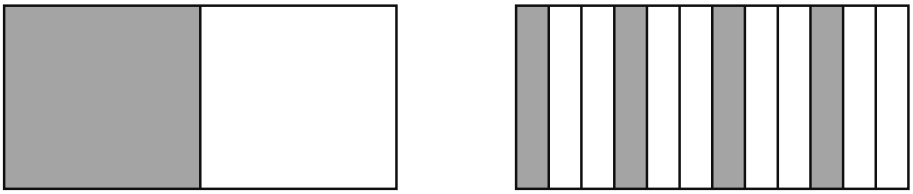
Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

42 The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

43 The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.



Model A **Model B**

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A ? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

44 A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

Answer _____ books

45 A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

Answer _____ inches

STOP

THE STATE EDUCATION DEPARTMENT
THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234
2022 Mathematics Tests Map to the Standards
Grade 4

Question	Type	Key	Points	Standard	Cluster
Session 1					
1	Multiple Choice	B	1	CCSS.Math.Content.4.MD.C.5b	Measurement and Data
2	Multiple Choice	C	1	CCSS.Math.Content.4.G.A.1	Geometry
8	Multiple Choice	D	1	CCSS.Math.Content.4.MD.A.3	Measurement and Data
9	Multiple Choice	B	1	CCSS.Math.Content.4.NBT.A.1	Number and Operations in Base Ten
13	Multiple Choice	C	1	CCSS.Math.Content.4.OA.A.1	Operations and Algebraic Thinking
14	Multiple Choice	D	1	CCSS.Math.Content.4.NF.B.3a	Number and Operations - Fractions
16	Multiple Choice	D	1	CCSS.Math.Content.4.MD.B.4	Measurement and Data
17	Multiple Choice	A	1	CCSS.Math.Content.4.NBT.A.3	Number and Operations in Base Ten
21	Multiple Choice	A	1	CCSS.Math.Content.4.NF.A.2	Number and Operations - Fractions
22	Multiple Choice	D	1	CCSS.Math.Content.4.MD.C.6	Measurement and Data
23	Multiple Choice	D	1	CCSS.Math.Content.4.OA.A.3	Operations and Algebraic Thinking
24	Multiple Choice	C	1	CCSS.Math.Content.4.MD.C.5a	Measurement and Data
27	Multiple Choice	B	1	CCSS.Math.Content.4.NBT.B.5	Number and Operations in Base Ten
28	Multiple Choice	C	1	CCSS.Math.Content.4.G.A.2	Geometry
Session 2					
31	Multiple Choice	C	1	CCSS.Math.Content.4.NF.B.3d	Number and Operations - Fractions
32	Multiple Choice	C	1	CCSS.Math.Content.4.OA.A.2	Operations and Algebraic Thinking
33	Multiple Choice	A	1	CCSS.Math.Content.3.MD.B.4	Measurement and Data
34	Multiple Choice	D	1	CCSS.Math.Content.4.OA.A.1	Operations and Algebraic Thinking
35	Multiple Choice	B	1	CCSS.Math.Content.4.NF.B.3c	Number and Operations - Fractions
36	Multiple Choice	A	1	CCSS.Math.Content.4.OA.A.3	Operations and Algebraic Thinking
37	Multiple Choice	B	1	CCSS.Math.Content.4.NBT.B.6	Number and Operations in Base Ten
38	Multiple Choice	C	1	CCSS.Math.Content.4.OA.A.2	Operations and Algebraic Thinking
39	Constructed Response		2	CCSS.Math.Content.4.OA.C.5	Operations and Algebraic Thinking
40	Constructed Response		2	CCSS.Math.Content.4.MD.C.7	Measurement and Data
41	Constructed Response		2	CCSS.Math.Content.4.G.A.3	Geometry
42	Constructed Response		2	CCSS.Math.Content.4.NBT.A.2	Number and Operations in Base Ten
43	Constructed Response		2	CCSS.Math.Content.4.NF.A.2	Number and Operations - Fractions
44	Constructed Response		2	CCSS.Math.Content.4.NBT.B.5	Number and Operations in Base Ten
45	Constructed Response		3	CCSS.Math.Content.4.NF.B.4c	Number and Operations - Fractions

*This item map is intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedural and conceptual understanding.

2-Point Holistic Rubric

2 Points	A 2-point response includes the correct solution to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution and the demonstration of a thorough understanding
1 Point	A 1-point response demonstrates only a partial understanding of the mathematical concepts and/or procedures in the task. This response • correctly addresses only some elements of the task • may contain an incorrect solution but applies a mathematically appropriate process • may contain the correct solution but required work is incomplete
0 Points*	A 0-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

3-Point Holistic Rubric

3 Points	A 3-point response includes the correct solution(s) to the question and demonstrates a thorough understanding of the mathematical concepts and/or procedures in the task. This response • indicates that the student has completed the task correctly, using mathematically sound procedures • contains sufficient work to demonstrate a thorough understanding of the mathematical concepts and/or procedures • may contain inconsequential errors that do not detract from the correct solution(s) and the demonstration of a thorough understanding
2 Points	A 2-point response demonstrates a partial understanding of the mathematical concepts and/or procedures in the task. This response • appropriately addresses most but not all aspects of the task using mathematically sound procedures • may contain an incorrect solution but provides sound procedures, reasoning, and/or explanations • may reflect some minor misunderstanding of the underlying mathematical concepts and/or procedures
1 Point	A 1-point response demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task. This response • may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete • exhibits multiple flaws related to misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning • reflects a lack of essential understanding of the underlying mathematical concepts • may contain the correct solution(s) but required work is limited
0 Points*	A 0-point response is incorrect, irrelevant, incoherent, or contains a correct solution obtained using an obviously incorrect procedure. Although some elements may contain correct mathematical procedures, holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.

* Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted).

2022 2- and 3-Point Mathematics Scoring Policies

Below are the policies to be followed while scoring the mathematics tests for all grades:

1. If a student shows the work in other than a designated "Show your work" or "Explain" area, that work should still be scored.
2. If the question requires students to show their work, and the student shows appropriate work and clearly identifies a correct answer but fails to write that answer in the answer space, the student should still receive full credit.
3. If students are directed to show work or provide an explanation, a correct answer with **no** work shown or **no** explanation provided, receives **no** credit.
4. If students are **not** directed to show work, any work shown will **not** be scored. This applies to items that do **not** ask for any work and items that ask for work for one part and do **not** ask for work in another part.
5. If the student provides one legible response (and one response only), the rater should score the response, even if it has been crossed out.
6. If the student has written more than one response but has crossed some out, the rater should score only the response that has **not** been crossed out.
7. If the student provides more than one response, but does not indicate which response is to be considered the correct response and none have been crossed out, the student shall not receive full credit.
8. If the student makes a conceptual error (that is an error in understanding rather than an arithmetic or computational error), that student shall not receive more than 50% credit.
9. Trial-and-error responses are **not** subject to Scoring Policy #6 above, since crossing out is part of the trial-and-error process.
10. If a response shows repeated occurrences of the same conceptual error within a question, the conceptual error should **not** be considered more than once in gauging the demonstrated level of understanding.
11. In questions requiring number sentences, the number sentences must be written horizontally.
12. When measuring angles with a protractor, there is a +/- 5 degrees deviation allowed of the true measure.
13. Condition Code A is applied whenever a student who is present for a test session leaves an entire constructed-response question in that session completely blank (no response attempted). This is not to be confused with a score of zero wherein the student does respond to part or all of the question but that work results in a score of zero.

EXEMPLARY RESPONSE

39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

1 ticket = 9 points

2 tickets = 18 points

3 tickets = 27 points

4 tickets = 36 points

5 tickets = 45 points

6 tickets = 54 points

or

9, 18, 27, 36, 45, 54

or

$54 \div 9 = 6$

or

$9 + 9 + 9 + 9 + 9 + 9 = 54$

or other valid process

Answer 6 tickets

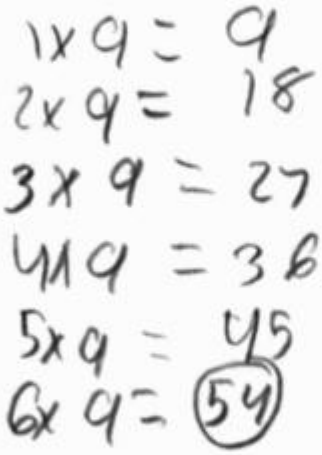
39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.



Answer 6 tickets

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The quantity of tickets is calculated correctly using a multiplication table. This response is correct and complete.

GUIDE PAPER 2

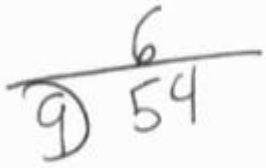
39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.



Answer 6 tickets

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The quantity of tickets is calculated correctly by using division. This response is complete and correct.

GUIDE PAPER 3

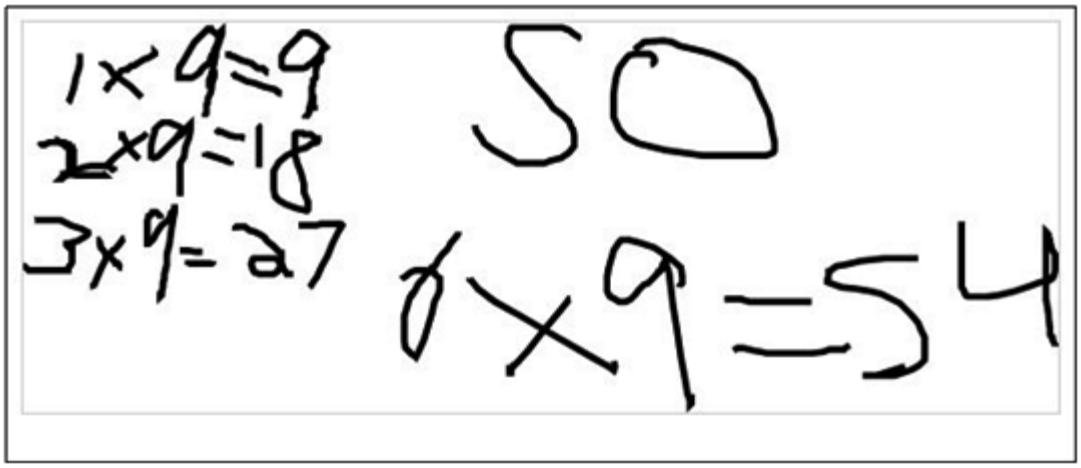
39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.



Answer 6 tickets

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The quantity of tickets is calculated correctly by computing the multiples of 9. This response is correct and complete.

GUIDE PAPER 4

39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

4 ticket is 36 Points
5 ticket is 45 Points
6 ticket is 54 points

Answer 3 time tickets

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. This response contains an incorrect solution; however, the work shows an understanding of the pattern in the prompt. This response contains an incorrect solution but provides an appropriate process.

GUIDE PAPER 5

39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

$9 \times 6 = 54$

Answer 54 tickets

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The work is done correctly, but the product is incorrectly chosen as the solution. This response contains an incorrect solution but shows a mathematically appropriate process.

GUIDE PAPER 6

39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

27 tickets, 36 tickets , 45 tickets, 54 tickets ,

Answer 3 tickets tickets

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The response shows the correct list of multiples of 9 (27 tickets, 36 tickets, etc.) but obtains the solution of 3. This response contains an incorrect solution but applies an appropriate process.

GUIDE PAPER 7

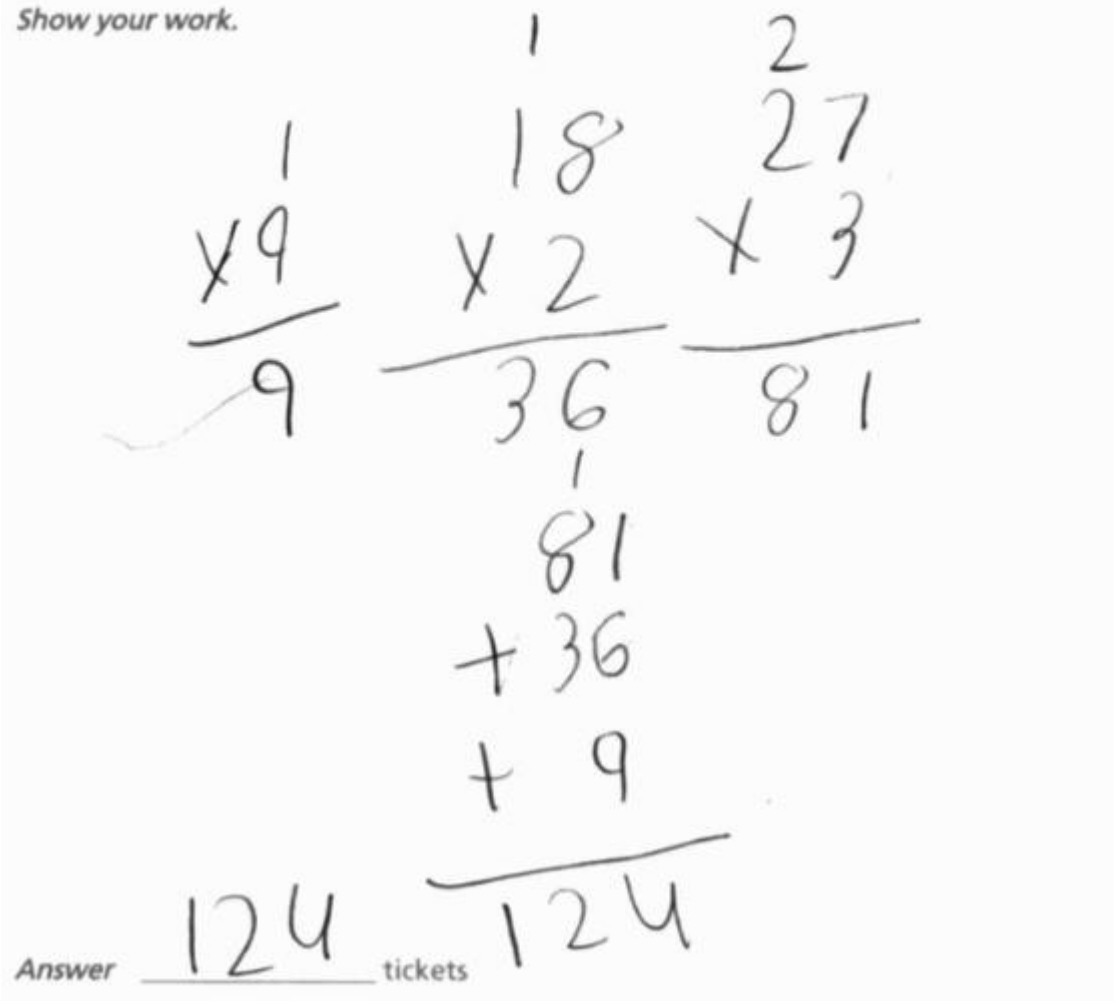
39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.



Answer 124 tickets

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The quantities of the tickets are inappropriately multiplied and added. An incorrect solution is obtained using an incorrect procedure.

39

The relationship between tickets earned and points earned in a game is described below.

- 1 ticket earned for every 9 points earned
- 2 tickets earned for every 18 points earned
- 3 tickets earned for every 27 points earned

If the pattern continues, how many tickets are earned when 54 points are earned?

Show your work.

1 is 9
2 is 18
3 is 27
4 is 54

Answer 4 is 54 tickets

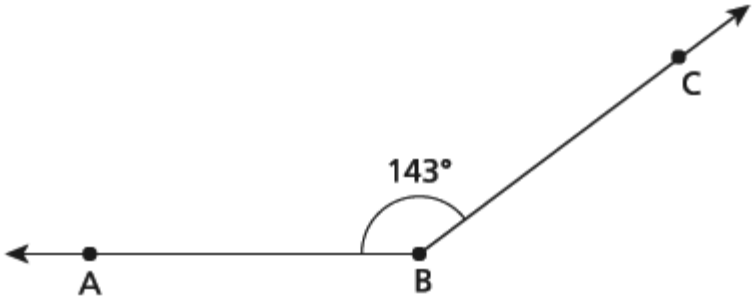
Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect solution is obtained by using an incorrect procedure.

EXEMPLARY RESPONSE

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD. What is the measure, in degrees, of angle CBD?

Show your work.

$\angle ABD = 180°$

$\angle ABD - \angle ABC = \angle CBD$

$180° - 143° = 37°$

or

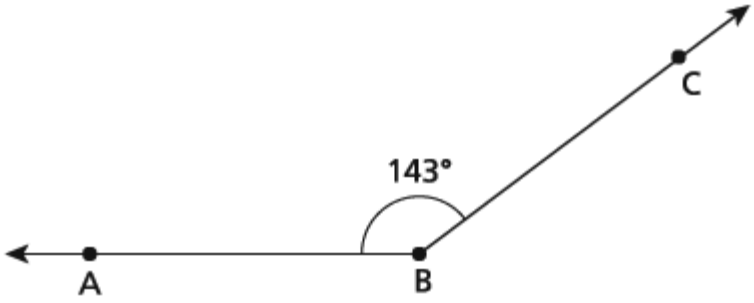
$143 + 37 = 180$

or other valid process

Answer 37 degrees

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

$$\begin{array}{r} 180 \\ -\ 143 \\ \hline 37 \end{array}$$

Answer 37 degrees

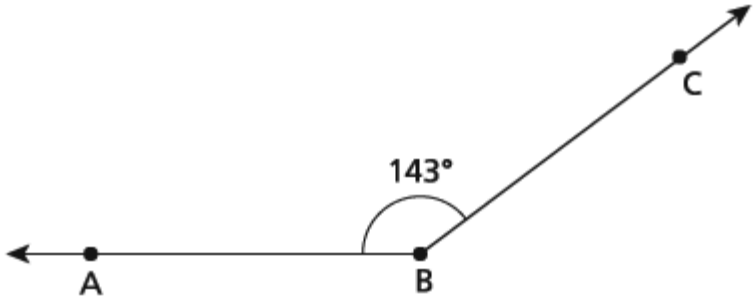
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The measure of angle ABC is correctly subtracted from 180 degrees to obtain the measure of angle CBD. This response is correct and complete.

GUIDE PAPER 2

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

143
+37

180

Answer 37 degrees

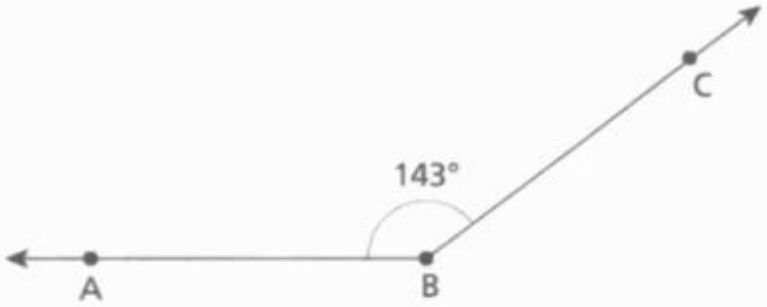
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The measure of angle CBD is obtained using a sound procedure. This response is correct and complete.

GUIDE PAPER 3

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

Straight line
180 degrees

710
−180
130
37

148
+ 37°
180°

Answer 37° degrees

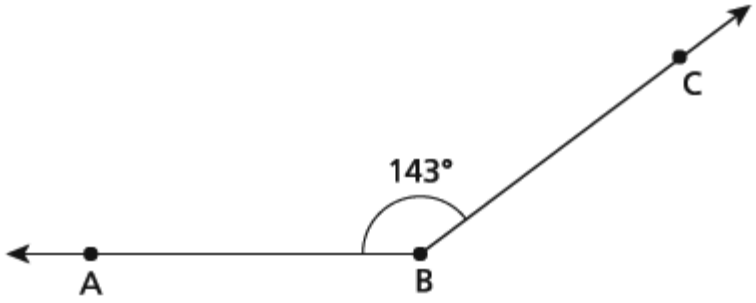
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The measure of the angle ABC is subtracted from 180 degrees to obtain the measure of the new angle CBD and checked by adding the measures of the angle ABC and angle CBD to obtain a total of 180 degrees. This response is correct and complete.

GUIDE PAPER 4

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

Answer 143 degrees

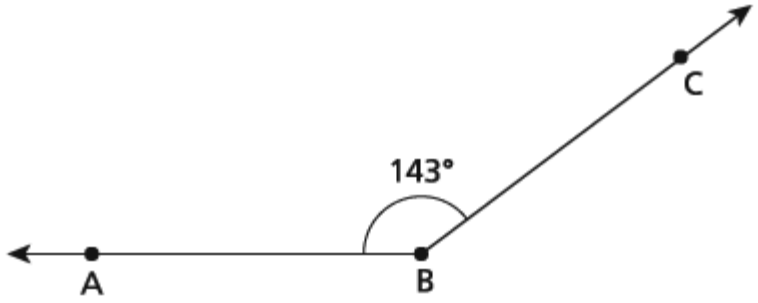
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The measure of angle ABC is subtracted from 180 degrees to obtain the measure of angle CBD; however, angle ABC is provided as the solution, not angle CBD. This response contains an incorrect solution but applies a mathematically correct process.

GUIDE PAPER 5

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

180-143=38

Answer 38 degrees

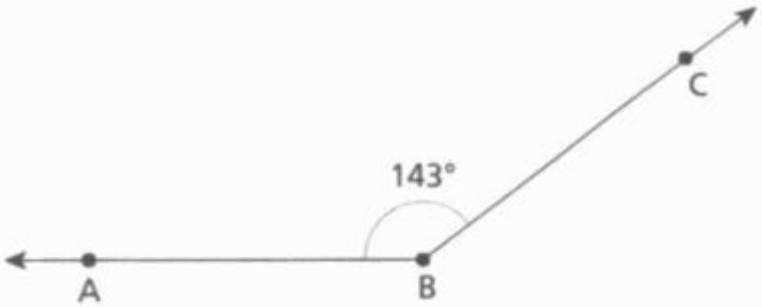
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. There is a calculation error when subtracting angle ABC from angle ABD (180 degrees). This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 6

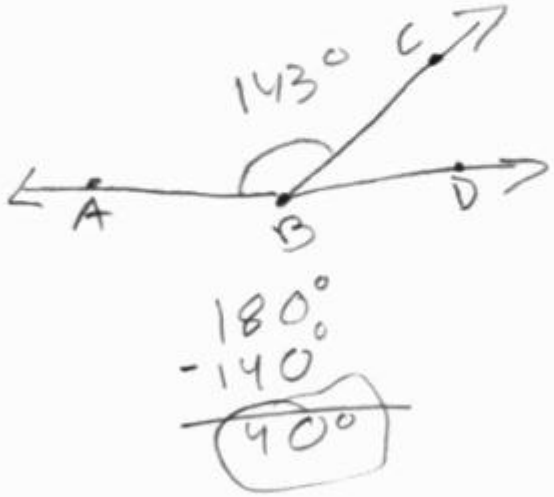
40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.



Answer 40° degrees

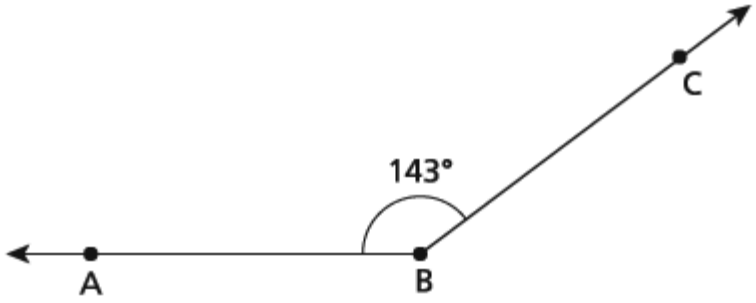
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A transcription error of using 140 degrees instead of 143 degrees results in an incorrect solution. This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 7

40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.

the diagram is a acute angle because I mesrd the picher

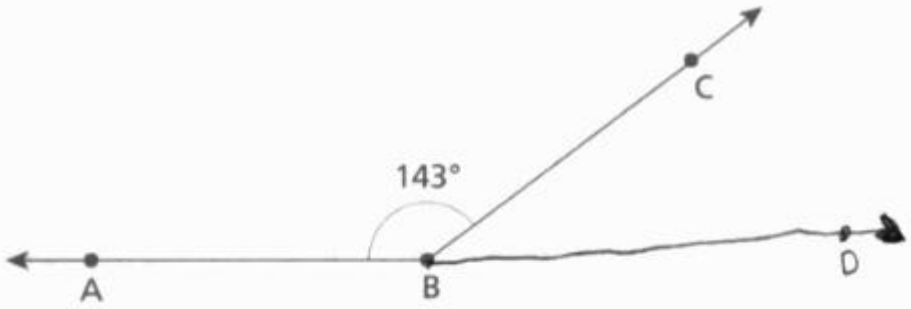
Answer the answer of the diagram is a acute angle and it is 38 or 39 degrees

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although angle CBD is approximately measured with the protractor, holistically, the response shows no overall understanding of how to mathematically find supplementary angles. This response contains an incorrect solution obtained by an inappropriate procedure.

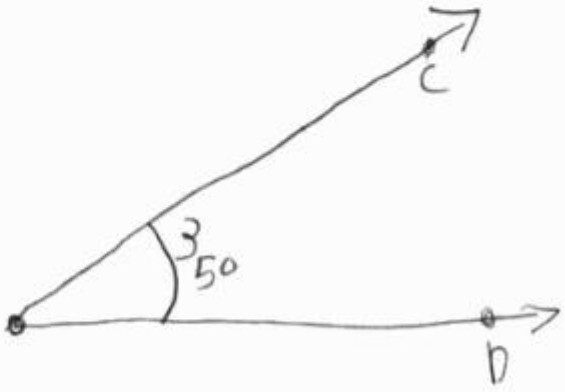
40

The diagram below shows angle ABC.



Ray BD is added to the diagram to create straight angle ABD and new angle CBD.
What is the measure, in degrees, of angle CBD?

Show your work.



Answer 35° degrees

Score Point 0 (out of 2 points)

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Ray BD is added to angle ABC to create angle ABD but is does not appear to create a straight angle. Angle CBD is redrawn, with a measure of 35 degrees. This response contains an incorrect solution, with insufficient explanation of how that solution was obtained.

EXEMPLARY RESPONSE

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

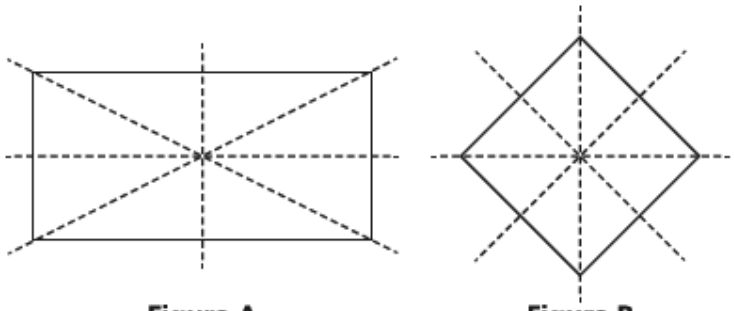


Figure A **Figure B**

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B shows all correct lines of symmetry. I know this is true because if you fold the figure on any of the dotted lines, the two parts coincide exactly.

or

Figure B, because Figure A does not show only correct lines of symmetry. I know this is true because if you fold the figure on one of the diagonal lines, the two parts are equal, but do not coincide exactly.

or other valid explanation

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

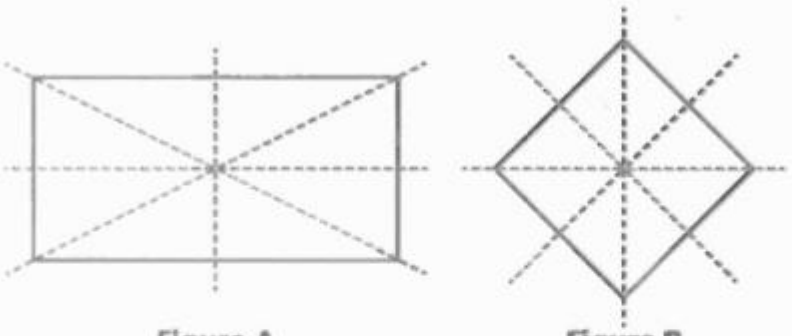


Figure A Figure B

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B shows only correct lines of symmetry because no matter which way you fold a square in half the two halves overlap perfectly.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The correct figure is selected, and a valid explanation is provided. This response is correct and complete.

GUIDE PAPER 2

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

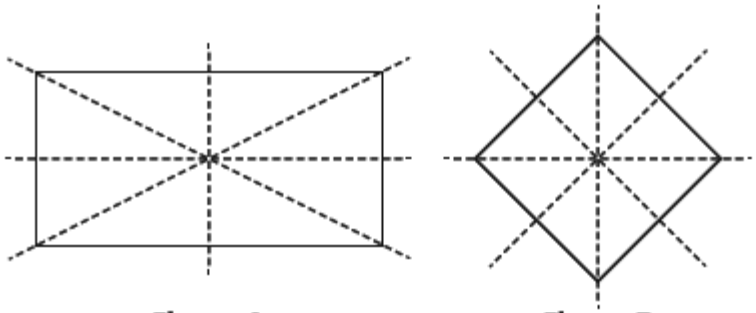
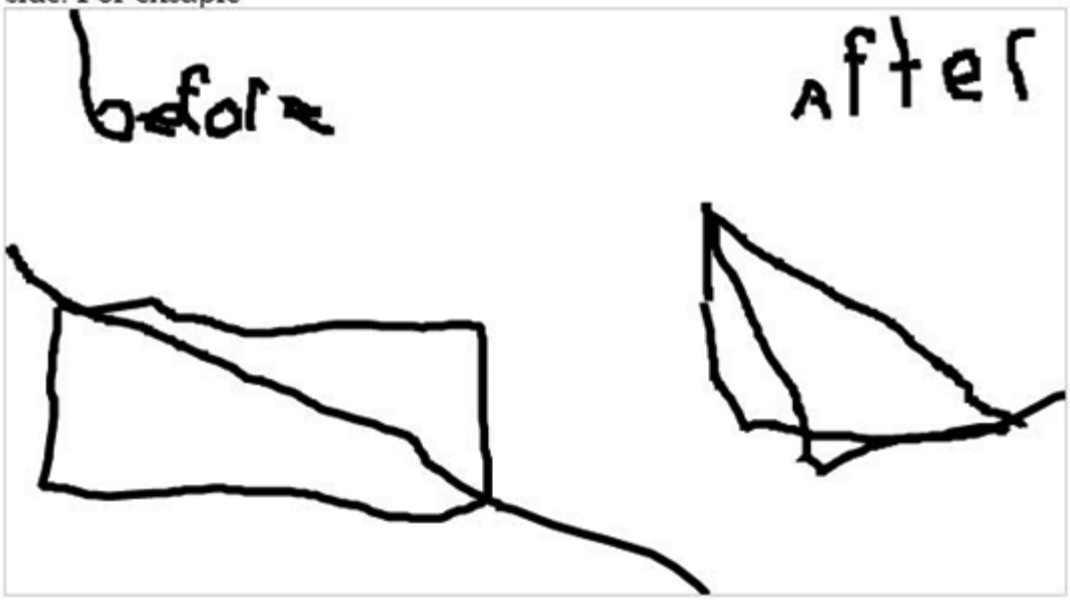


Figure A **Figure B**

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B is correct because if you foleded figure A is would go over each side. For exsaple



Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The correct figure is selected, and a valid explanation and illustration is provided as to why a diagonal line is not a line of symmetry in Figure A. This response is correct and complete.

GUIDE PAPER 3

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

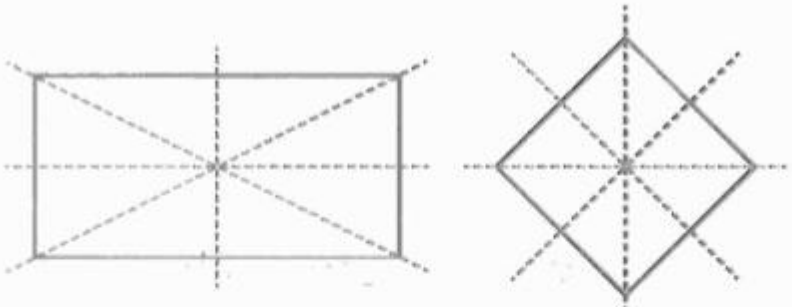


Figure A

Figure B

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B. I chose figure B is because that is a square. It is not figure A is because if you fold it diaginally it would not be the same.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The correct figure is selected, and a valid explanation is provided as to why a diagonal line is not a line of symmetry in Figure A.

GUIDE PAPER 4

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

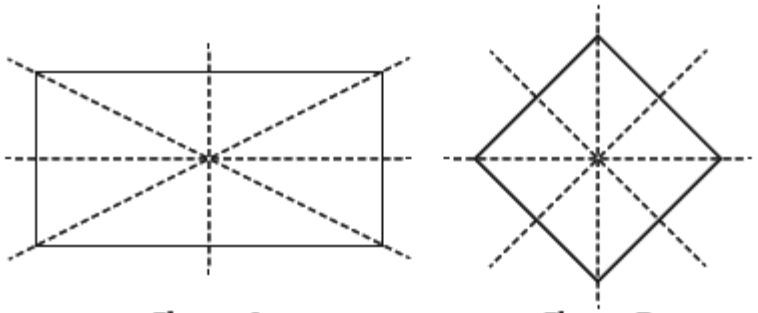
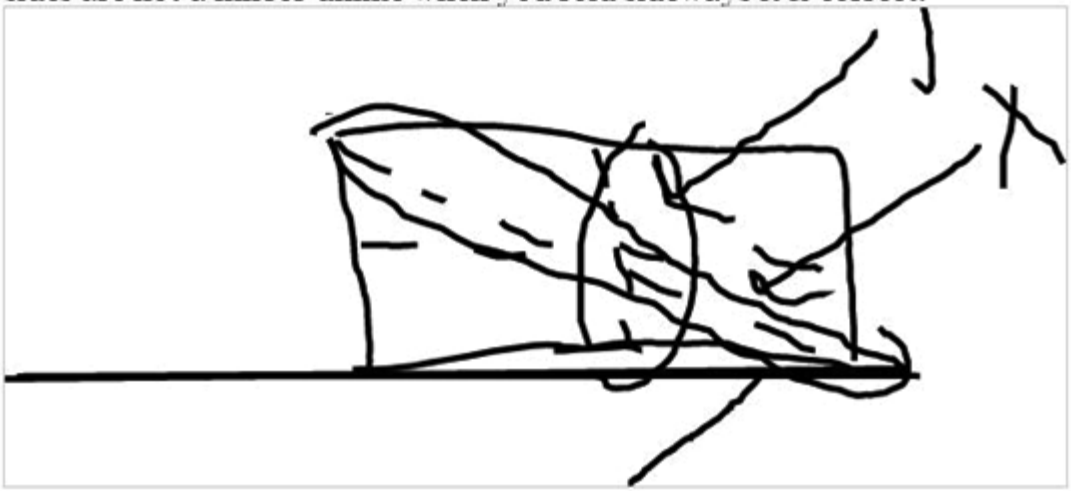


Figure A **Figure B**

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure a you can not fold diaganaly. The only reason you cant is that the sides are not a mirror unlike when you fold sideways it is correct.



Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. An acceptable explanation of symmetry is provided, but Figure B is not explicitly chosen as an example of correct lines of symmetry. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

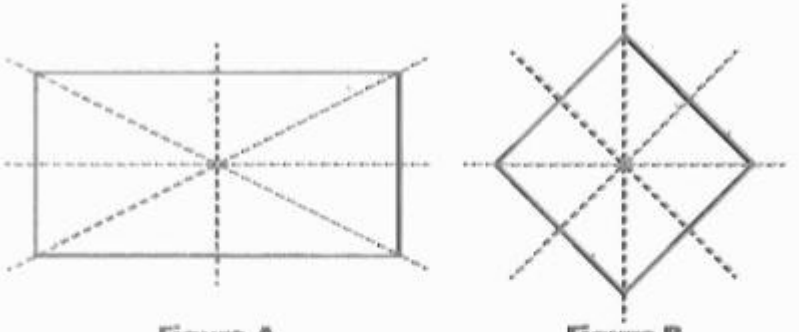


Figure A

Figure B

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B only shows correct lines of symmetry because in figure A the corner to corner would not work

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The correct figure is chosen, but the explanation is not explicit as to which lines in Figure A will not create lines of symmetry. This response correctly addresses only some elements of the task.

GUIDE PAPER 6

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

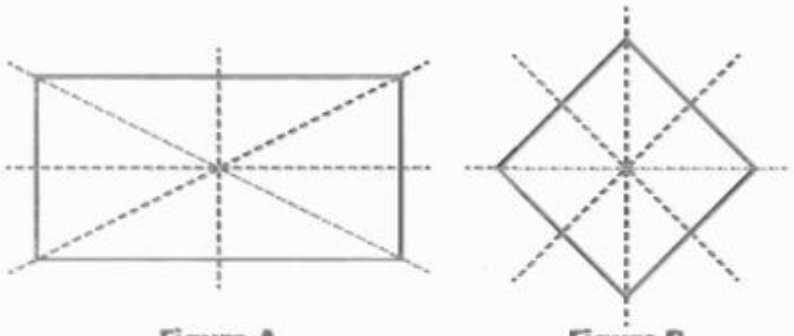


Figure A

Figure B

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

Figure B is the answer because Figure a has a star of dotted lines and it's not even Figure a only has two lines of symmetry that's why it's Figure B.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Figure B is correctly chosen; however, the explanation does not sufficiently describe why only two of the dotted lines in Figure A are lines of symmetry. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

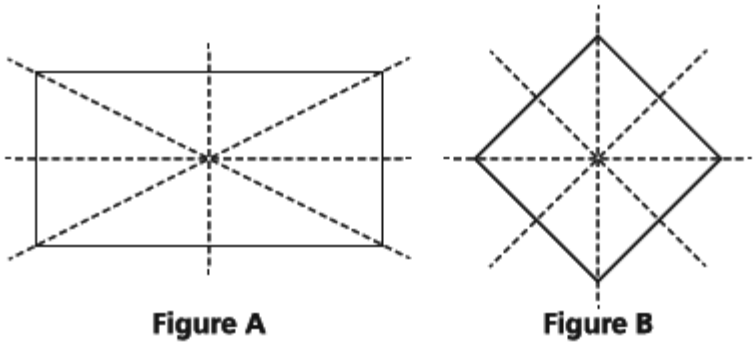


Figure A **Figure B**

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

because you can not fold a rectangle diaganal

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The explanation is not sufficient because both figures are rectangles, and neither figure is explicitly selected.

41

Dotted lines were added to the two figures shown below to represent lines of symmetry.

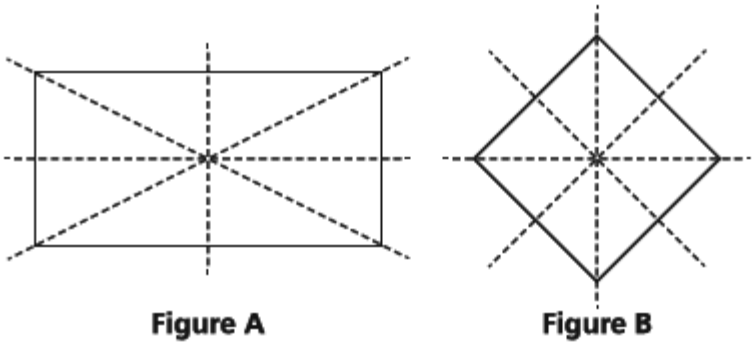


Figure A Figure B

Which figure shows only correct lines of symmetry?

Explain how you know your answer is correct.

A ownly can have 2 lines of symmetry
B ownly can have 4 lines of symmetry

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Neither figure is selected, and the explanation for lines of symmetry is insufficient.

EXEMPLARY RESPONSE

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

The population of City B is greater than the population of City A because 84,216 > 84,206. I know this is true because all the digits in the two numbers are the same except for the digit in the tens place and 1 is greater than 0.

or other valid explanation

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

A = 84,206
B =84,216

84,206 < 84,216

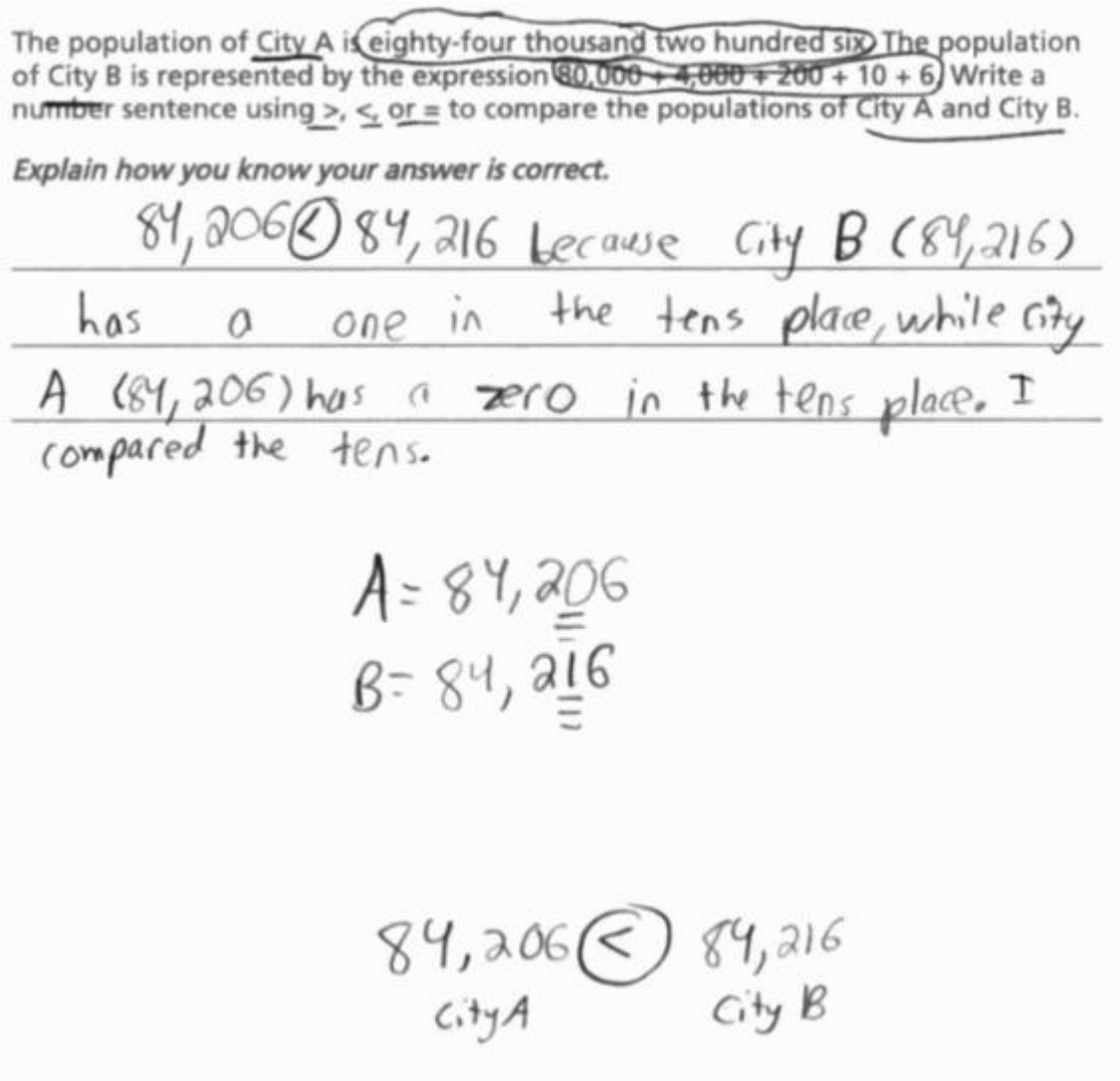
I know my answer is correct because first I looked at the ten thousands place and the numbers were the same then I looked at the thousands place and they were the same then I looked at the hundreds and they were the same then I looked at the tens and there was a one in 84,216 and a zero in 84,206 and I know one is greater than zero so I said that 84,216 was greater than 84,206.

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. An accurate number sentence is provided, and the place values are correctly compared. The explanation is correct and complete.

GUIDE PAPER 2

42



The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

84,206 < 84,216 because City B (84,216) has a one in the tens place, while City A (84,206) has a zero in the tens place. I compared the tens.

A = 84,206

B = 84,216

84,206 < 84,216

City A City B

Score Point 2 (out of 2 points)

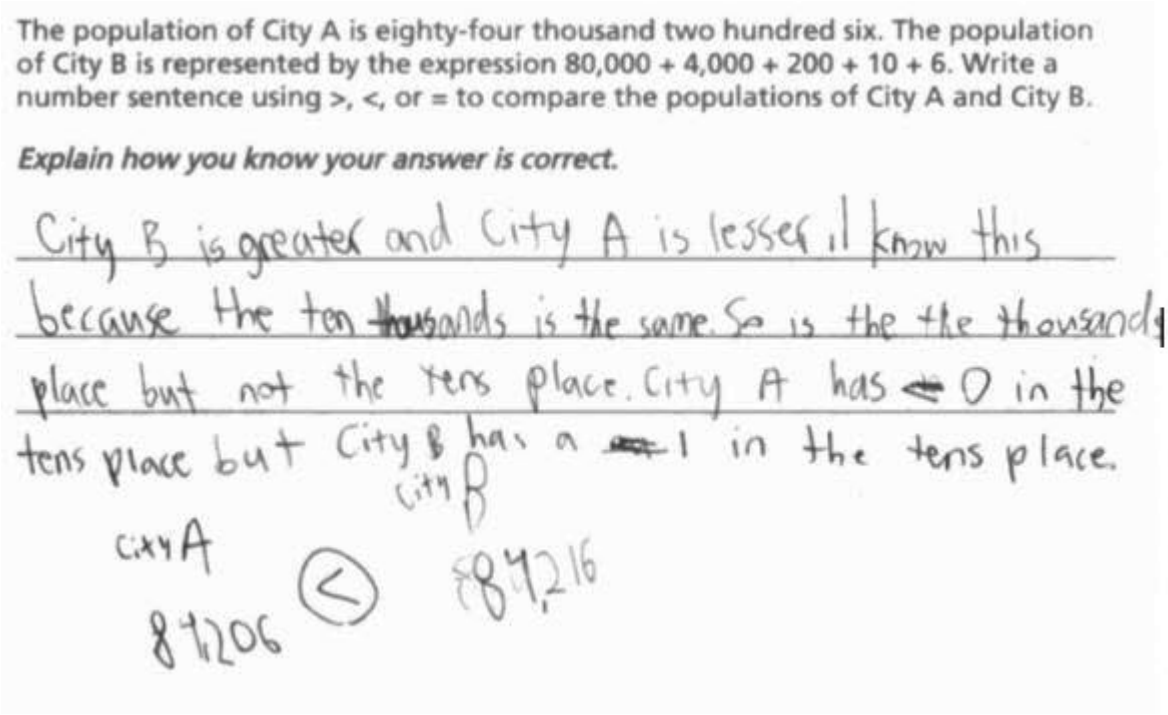
This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. An accurate number sentence is provided, and the place values are correctly compared. The explanation is correct and complete.

GUIDE PAPER 3

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.



Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. An accurate number sentence is provided, and the place values are correctly compared in the provided explanation. The explanation is correct and complete.

GUIDE PAPER 4

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

84216 > 84206

I know my answer is correct because one has 16 the other only has 6.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. An accurate number sentence is provided. However, the explanation does not sufficiently compare the value of digits in the tens place in the two numbers. The explanation correctly addresses only some elements of the task.

GUIDE PAPER 5

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

80,000+4,000+200+10+6 = 84,216.

80,000+4,000+200+00+6 = 84,206

84,216 is greater than 84,206. I know 84,216 is greater than 84,206 because in the Tens place of 84,206 their is a 0(zero). 1 is greater than 0. This is how I know 84,216 is greater than 84,206.

80,000
4,000
200
10
+ 6
84,216

80,000
4000
200
00
+ 6
84,206

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. No number sentence using < or > is provided, but the place values are accurately compared in the provided explanation. The explanation correctly addresses only some elements of the task.

GUIDE PAPER 6

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

84,206 < 84,216

84,206 is less than 84,216. and 84,216 is greater than 84,206.

Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. An accurate number sentence is provided. However, the place values of the digits in the two numbers are not compared. The explanation correctly addresses only some elements of the task.

GUIDE PAPER 7

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

84,206 (<) 84,210

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although a correct comparison is provided, only one correct number is written and the explanation is insufficient.

42

The population of City A is eighty-four thousand two hundred six. The population of City B is represented by the expression 80,000 + 4,000 + 200 + 10 + 6. Write a number sentence using >, <, or = to compare the populations of City A and City B.

Explain how you know your answer is correct.

8426 is < 84216

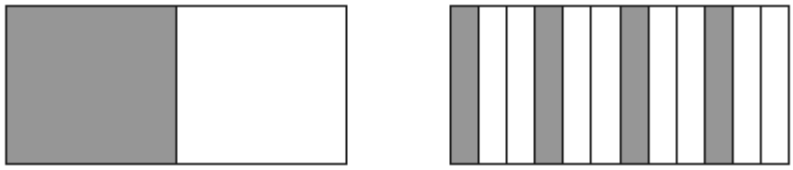
Score Point 0 (out of 2 points)

Holistically, this response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The explanation is unable to correctly convert the population of City A from expanded form to standard form; although the number sentence provided is true, it is not a correct solution.

EXEMPLARY RESPONSE

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.



Model A **Model B**

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

The shaded part of Model A is equal to $\frac{1}{2}$, and the shaded part of Model B is equal to $\frac{4}{12}$.

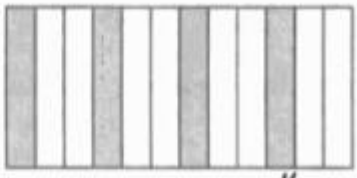
Model B needs 2 more parts shaded (or $\frac{2}{12}$ shaded), so that the shaded part equals $\frac{6}{12}$. I know this is correct because $\frac{6}{12}$ is equal to $\frac{1}{2}$.

or other valid explanation

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

Model A $\frac{1}{2}$



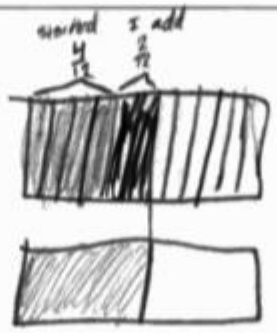
Model B $\frac{4}{12}$

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

I added $\frac{2}{12}$ to model B. $\frac{4}{12}+\frac{2}{12}=\frac{6}{12}\div 6\ \frac{1}{2}=\frac{6}{12}$.

$\frac{1}{2}\times 6\ \frac{6}{12}$



$\frac{4}{12}+\frac{2}{12}=\frac{6}{12}=\frac{1}{2}$

Score Point 2 (out of 2 points)

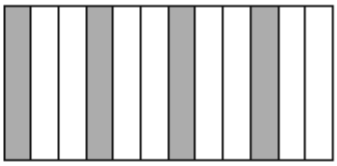
This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The fraction $\frac{2}{12}$ is correctly added to Model B and is correctly compared to $\frac{1}{2}$ to show that the two shaded areas are the same. This response is complete and correct.

GUIDE PAPER 2

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

Model A



Model B

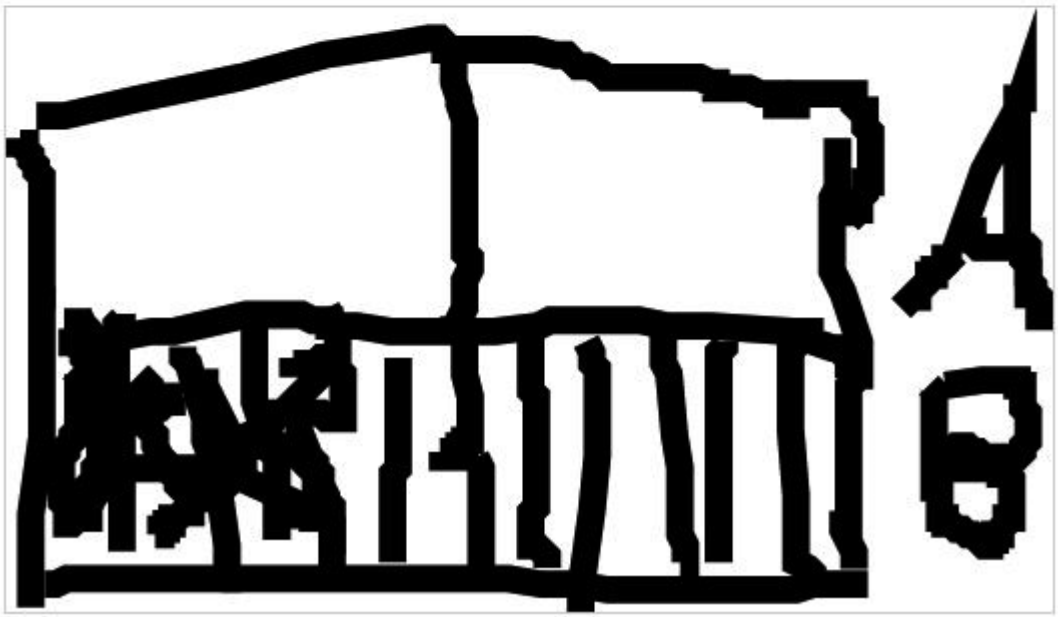
How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

$\frac{4}{12} \neq \frac{1}{2}$

$\frac{6}{12} - \frac{4}{12} = \frac{2}{12}$

2 more boxes need to be shaded in to make half because 6 is half of 12



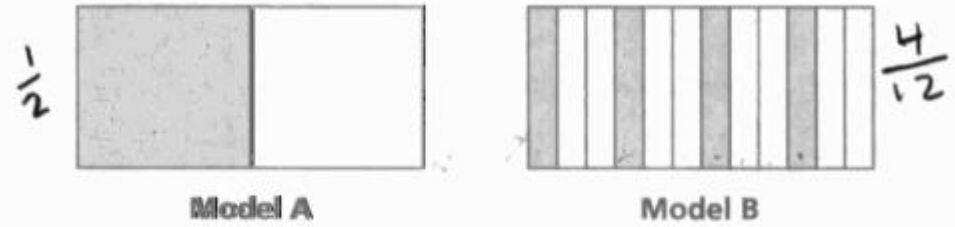
Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The difference between the shaded areas of Model A and Model B is correctly calculated, and the number of additional boxes to be shaded is correctly determined. This response is complete and correct.

GUIDE PAPER 3

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.



Model A Model B

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

Model B needs $\frac{2}{12}$ to be equivalent to Model A. $\frac{4}{12}+\frac{2}{12}=\frac{6}{12}$ $\frac{6}{12}=\frac{1}{2}$.

Score Point 2 (out of 2 points)

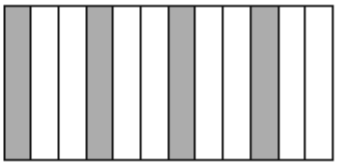
This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The fraction ½ is shown to be equal to ⁶⁄₁₂, and the shaded part of Model B is added to ²⁄₁₂ to be equal to Model A. This response is complete and correct.

GUIDE PAPER 4

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

Model A



Model B

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

modle B needs to shade in two more lines to copy modle A.

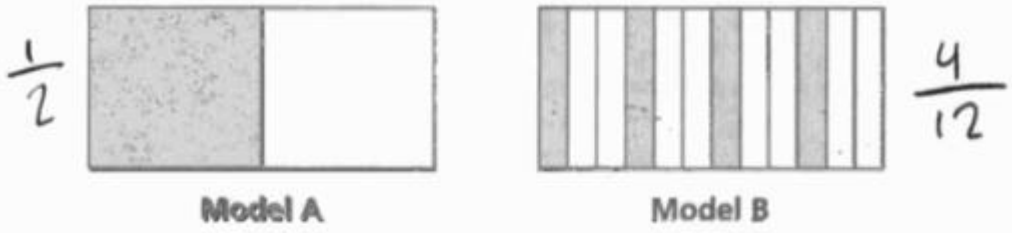
Score Point 1 (out of 2 points)

This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. The difference between the two models is correctly addressed; however, the explanation is incomplete as it does not provide a new fraction. This response correctly addresses only some elements of the task.

GUIDE PAPER 5

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.



How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

2/12 more of a fraction is needed. 2/12 more because if you put Model A bellow Model B than you have to shade 2/12 more and then you will know if 4/12 and 1/2 are equvilent.

DO NOT WRITE BEYOND THIS AREA

Score Point 1 (out of 2 points)

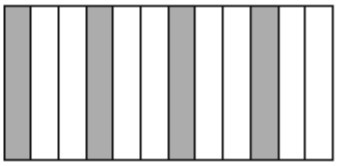
This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. A comparison is made between 4/12 and 1/2, and they accurately state that 2/12 is needed to make Model B equivalent to Model A; however, no explanation is provided for how 2/12 is obtained and no new fraction is provided. This response contains the correct solution, but the required work is incomplete.

GUIDE PAPER 6

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

Model A



Model B

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

$\frac{1}{2} > \frac{4}{12}$ They need $\frac{2}{12}$ more shaded.

Score Point 1 (out of 2 points)

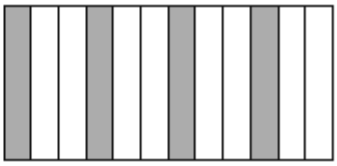
This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Model A is shown to not be equal to Model B. However, the explanation is incomplete, as no work for obtaining ²⁄₁₂ is shown, and no new fraction is provided. This response correctly addresses only some elements of the task.

GUIDE PAPER 7

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

Model A



Model B

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.

Model B would need $\frac{1}{12}$ more to be equal to Model A because B is $\frac{4}{12}$ and if you add $\frac{1}{12}$ it would be equal.

A= $\frac{1}{2}$

B= $\frac{4}{12}$

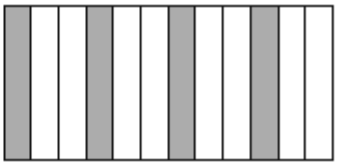
Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. The fraction 1/12 is added to 4/12, and the sum is incorrectly claimed to be equal to 1/2. The explanation is not sufficient to show an understanding of fractions.

43

The models shown below are the same size and divided into equal parts. The shaded parts in each model represent a fraction of a whole.

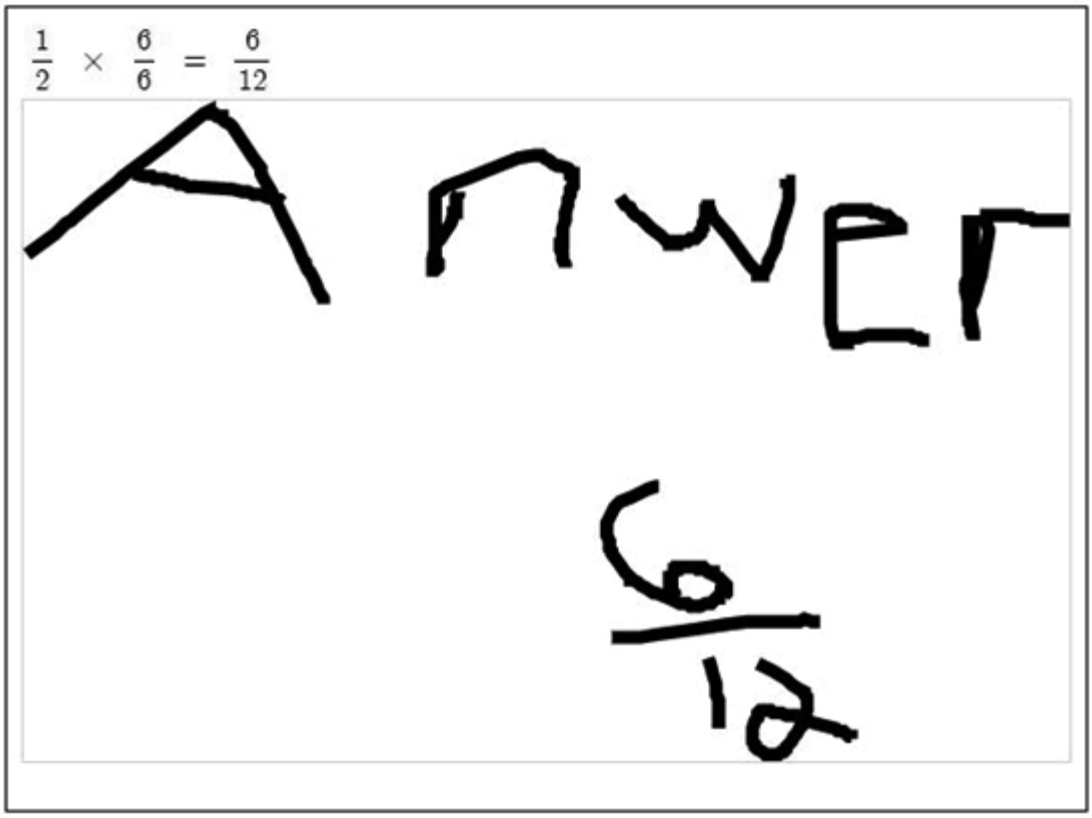
Model A



Model B

How many more parts in Model B need to be shaded to make the fraction represented by Model B equivalent to the fraction represented by Model A? Be sure to include the new fraction represented by Model B in your answer.

Explain how you know your answer is correct.



Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. A fraction equivalent to $\frac{6}{12}$ is written, but this does not sufficiently address the elements of the task.

EXEMPLARY RESPONSE

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

36 bookshelves
× 48 books per shelf
288
1,440
1,728 books

or other valid process

Answer 1,728 books

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

$36 \times 48 = 1{,}728$
6×8
6×40
8×30
30×40

Answer 1,728 books books

Score Point 2 (out of 2 points)

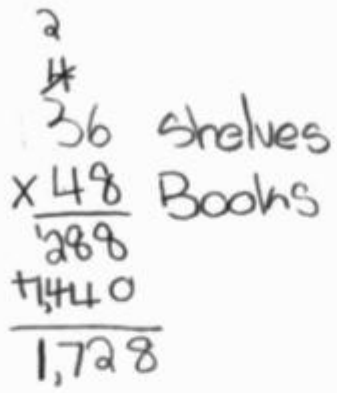
This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The total number of books is correctly determined using a sound procedure. This response is complete and correct.

GUIDE PAPER 2

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.



Answer 1,728 books

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The total number of books is correctly determined using a sound procedure. This response is complete and correct.

GUIDE PAPER 3

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

48
36
288
1440
1,728

Answer 1728 books

Score Point 2 (out of 2 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The two numbers are correctly multiplied to determine the solution. While the multiplication operator is absent from the work, this is an inconsequential error, as multiplication is correctly applied. This response contains an inconsequential error that does not detract from the correct solution.

GUIDE PAPER 4

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

$$\begin{array}{r} 36 \\ \times\ 48 \\ \hline 1440 \end{array}$$

Answer The book shelvs would hold 1440 books books

Score Point 1 (out of 2 points)

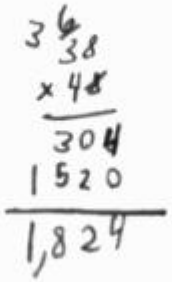
This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Although multiplication of the two numbers is part of the correct process to determine the total number of books, a calculation error results in an incorrect solution. This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 5

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.



Answer 1,824 books

Score Point 1 (out of 2 points)

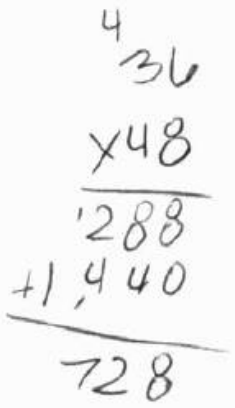
This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Although the multiplication of the two numbers is part of the correct process to determine the total number of books, an incorrect solution is obtained due to a transcription error, where 38 is used in place of 36. This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 6

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.



Answer 728 books

Score Point 1 (out of 2 points)

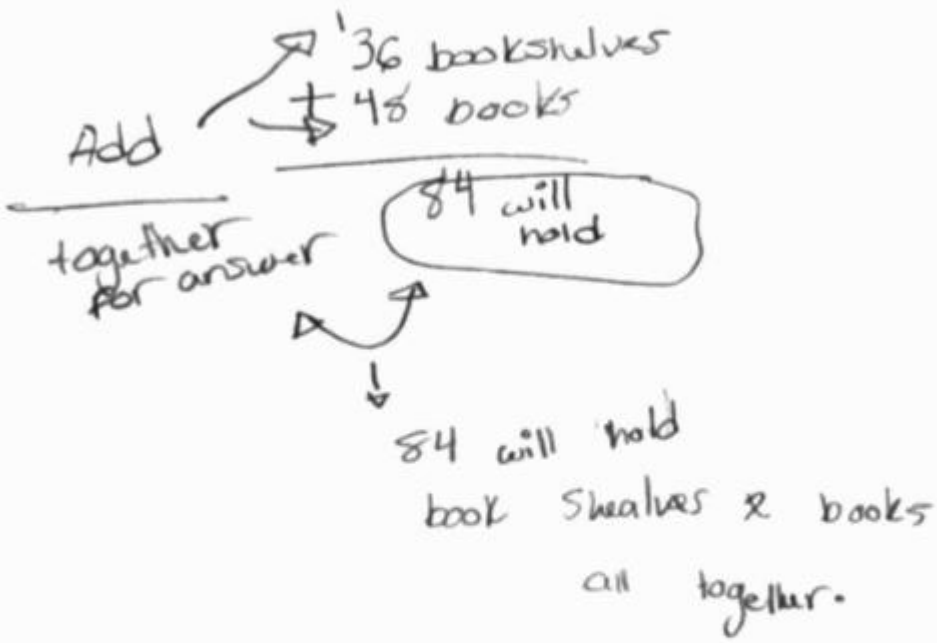
This response demonstrates only a partial understanding of the mathematical concepts and procedures in the task. Although multiplication of the two numbers is part of the correct process to determine the total number of books, a calculation error results in an incorrect solution. This response contains an incorrect solution but applies a mathematically appropriate process.

GUIDE PAPER 7

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.



Answer 84 books

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect procedure is used to obtain an incorrect solution.

44

A section of a library has 36 bookshelves. Each bookshelf holds exactly 48 books of similar size. What is the total number of books that all of the bookshelves will hold?

Show your work.

Answer 48 36=728 books

Score Point 0 (out of 2 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. An incorrect procedure is used to obtain an incorrect solution.

EXEMPLARY RESPONSE

45

A student is using wooden blocks to build two towers of different heights. All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$9 \times 3/4 = 27/4$ inches

$27/4 = 6\ 3/4$ inches

$5 \times 3/4 = 15/4$ inches

$15/4 = 3\ 3/4$ inches

$27/4 - 15/4 = 12/4$ inches

$6\ 3/4 - 3\ 3/4 = 3$ inches

$12/4 = 3$ inches

or

$9 - 5 = 4$

$4 \times 3/4 = 3$ inches

or other valid process

Answer 3 *or* $12/4$ inches

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$5 \times 3/4 = 15/4$

$9 \times 3/4 = 27/4$

$27/4 - 15/4 = 12/4$

Answer The difference of the to towers is 12/4 inches. inches

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The heights of towers are correctly calculated and subtracted to determine the solution. This response is complete and correct.

GUIDE PAPER 2

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$9 - 5 = 4$

$4 \times \frac{3}{4} = \frac{12}{4}$

Answer $\frac{12}{4}$ inches

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The difference in number of blocks is obtained, then the height of the difference is correctly calculated. This response is complete and correct.

GUIDE PAPER 3

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

Short tower: $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = 3\frac{3}{4}$

Tall tower: $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = 6\frac{3}{4}$

$6\frac{3}{4} - 3\frac{3}{4} = 3$

Answer 3 inches

Score Point 3 (out of 3 points)

This response demonstrates a thorough understanding of the mathematical concepts and procedures in the task. The heights of the short tower and tall tower are correctly calculated by repeated addition, and then compared correctly by subtraction to determine the correct solution. This response is complete and correct.

GUIDE PAPER 4

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

3/4 inches × 5/4 inches = 15/4 inches
3/4 inches × 9/4 inches = 27/ 4 inches
27/4 inches – 15/4 inches = 12/4 inches

Answer The difference is 12/4 inches. inches

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The correct solution is determined, using an appropriate procedure. However, ¾ is used in place of 5, and ¾ in place of 9. The use of inches in place of blocks does not detract from understanding of the task. This response addresses most, but not all, aspects of the task using mathematically sound procedures.

GUIDE PAPER 5

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$3/4 \times 5 = 15/4$
$3/4 \times 9 = 27/4$
$27/4 - 15/4 = 12$

Answer The difference in height is 12 inches

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The heights of the two towers are obtained correctly; however, the denominator is ignored when calculating the difference in height. This response reflects some minor misunderstanding of the underlying mathematical procedures.

GUIDE PAPER 6

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$3 \times 5 = \frac{15}{4}$ $9 \times 3 = \frac{27}{4}$

$$\begin{array}{r} 27 \\ -\,15 \\ \hline 12 \\ \hline 4 \end{array}$$

Answer $\frac{12}{4}$ inches

Score Point 2 (out of 3 points)

This response demonstrates a partial understanding of the mathematical concepts and procedures in the task. The heights of the towers are found using correct procedure; however, the denominators are left out of the work. This response reflects some minor misunderstanding of the underlying mathematical procedures.

GUIDE PAPER 7

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$5 \times 3 = 15$

$\frac{3}{4} = 3$

$15 = \frac{15}{4}$ *or* $= 3\frac{1}{4} = 3$ inches

$9 \times 3 = 27$

$27 = \frac{27}{4}$ *or* $= 6\frac{3}{4} = 6$ inches

$5 \times 3 = 15$
$= \frac{15}{4}$ or
$= 3\frac{1}{4}$
$= 3$ inches

$9 \times 3 = 27$
$= \frac{27}{4}$ or
$= 6\frac{3}{4}$
$= 6$ inches

So, there are the smallest tower = 3 inches and biggest tower = 6 inches

Answer inches

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The heights of the towers are calculated correctly; however, they are incorrectly converted to a mixed number. Also, there is no attempt made to obtain the difference. This response exhibits multiple flaws related to a misunderstanding of the important aspects of the task.

45

A student is using wooden blocks to build two towers of different heights. All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$$\begin{array}{r} 15 \\ +27 \\ \hline 42 \end{array}$$

$\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}=\frac{15}{4}+\frac{27}{4}=\frac{42}{4}$

$\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}+\frac{3}{4}=\frac{27}{4}$

Answer $\frac{+2}{4}$ inches

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The heights of the towers are correctly calculated. However, a conceptual error is made when the heights of the towers are added together, rather than obtaining the difference. Per Scoring Policy #8, this response cannot receive more than 50% credit. This response addresses only some elements of the task correctly, but reaches an inadequate, incomplete solution.

GUIDE PAPER 9

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$$9 \times \frac{3}{4} = \frac{27}{4}$$

Answer $\frac{27}{4}$ inches

Score Point 1 (out of 3 points)

This response demonstrates only a limited understanding of the mathematical concepts and procedures in the task. The height of the tall tower is correctly calculated; however, the height of the small tower and the difference in the heights is not addressed. This response addresses only some elements of the task, but an inadequate solution is reached.

GUIDE PAPER 10

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$5 \times 3/4 = 5\ 3/4$

$9 \times 3/4 = 9\ 3/4$

$9\ 3/4 + 5\ 3/4 = 14\ 3/4$

Answer it eqeals 14 3/4 inches

Score Point 0 (out of 3 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the process to calculate the height of the towers is set up correctly, the solutions are incorrect. Further, the heights of the towers are added, rather than subtracted, and the sum is incorrect. Some elements are correctly ordered mathematical procedures, but holistically, these elements are not sufficient.

45

A student is using wooden blocks to build two towers of different heights.

All of the blocks are the same size and have a height of $\frac{3}{4}$ inch. The short tower is 5 blocks high and the tall tower is 9 blocks high. What is the difference in height, in inches, between the short tower and the tall tower?

Show your work.

$$\begin{array}{r} 9 \\ -\ 5 \\ \hline 4 \end{array}$$

Answer 4 inches

Score Point 0 (out of 3 points)

This response is not sufficient to demonstrate even a limited understanding of the mathematical concepts in the task. Although the difference in the number of blocks is correctly calculated, the difference in inches is not addressed. Holistically, the work is insufficient to show any understanding.