

GEOMETRY ITEMS: OVERVIEW

Resources:

Attached you will find **practice items** for **Geometry**. These practice items are packaged so that you will have weekly items to use in your classroom as bell ringers or engagement items. Three items per day have been provided for this domain and should take no more than fifteen minutes of classroom instruction.

The purpose of using these practice items daily is to be able to formatively assess student understanding and any misconceptions they may have in this domain. Being able to gather evidence of student learning and misconceptions in the moment, will give you the flexibility to change your instruction to meet their needs. As the instructional decision-maker, you are able to adjust your methods for whole class or small groups to address student misconceptions and move them toward proficiency.

The practice items represent a variety of standards from the **Geometry** domain. **Two weeks of practice items** have been selected for this domain. Because there is only three weeks, every standard may not be addressed.

The goal is for you to have a total of 10 weeks of practice items that represent the 5 domains in 8th grade. We would like for you to use these items for a 10 week period between the time you receive them and the end of January. If used daily for student and teacher practice, in accordance with our recommendations or tips, the outcome will be an improvement in ACT ASPIRE test scores.

At the end of each weekly packet, you will find an answer key for your use. **Although answer keys are provided, students should explain their thinking during the discussion of the practice item.**

A separate resource available to you is tasks addressing each of the domains. These tasks require students to think about an efficient strategy to solve the problem, show their work and justify their reasoning. This is the ultimate goal for what we want students to be able to do.

Recommendations or Tips:

When administering the practice items, please allow students to read through the daily items to see if they have any questions about vocabulary or what the problem is asking them to do prior to engagement. Taking the time to do these things now, will help to ensure that students are familiar with vocabulary and the different question types before the actual test.

Providing Feedback to Students:

Since the purpose of the test practice items is to assess student understanding, it is not enough just to give the practice items as bell ringers or engagement items. **A key part of the process for advancing student thinking, is to debrief the practice items and provide specific feedback on the student thinking and performance.** This can be done during the sharing out process by asking effective questions. It is difficult to make student thinking and understanding visible by just giving **multiple choice** questions and determining whether their response is correct or incorrect. Asking questions similar to the ones below can help students verbalize the reasoning for their choices:

- To get the correct solution, what concept do you have to be aware of?
- Why are the answer choices you did not choose incorrect?

- What strategy did you use to solve the problem? Why did you use that particular strategy?
- Is there another strategy that you could use to solve the problem?

The above questions can be used with **short response** and **constructed response** also. Other questions to consider when prompting students to verbalize or justify their thinking are:

Monitoring as students work:

- What is the problem asking you to find?
- How would you start the problem? How did you start the problem?
- What else do you need to do?

During debriefing:

- What did the problem ask you to do?
- What information do you see in the problem?
- What did you do first to solve this problem?
- Who else started this same way?
- What did you do next?
- Who started a different way?
- What are some strategies that you heard today that you would like to try when solving a similar problem in the future?

Answer Key:

The information above is intended to help teachers assess student understanding of the mathematical idea(s) in each problem. Also provided is an Answer Key for each set of items. While it is important for students to get the answer correct, **it is equally important for them to understand how their thinking leads or does not lead to a correct solution.** Incorrect solutions set the stage for teachable moments!!!!

Name _____

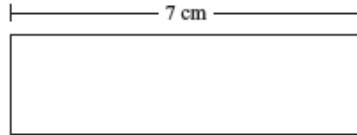
Date _____

Set 1 - Standard(s): 7.G.1, 7.G.4

NAEP Questioning Tool, Smarter Balance

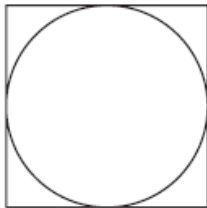
Day 1 Items

1. A rectangle and one of its dimensions are shown below.



The perimeter of the rectangle is 18 centimeters. What is the **area**, in square centimeters, of the rectangle?

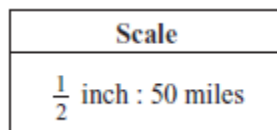
2. A circle inscribed in a square is shown below.



The area of the square is 81 square centimeters.

Which of the following is closest to the circumference, in centimeters, of the circle inscribed in the square? (Use 3.14 for π .)

- a. 14.13
 - b. 28.26
 - c. 63.59
 - d. 127.17
3. Adan has a map with the following scale.



The distance on the map from Clarksville to Jackson is 2 inches. What is the actual distance from Clarksville to Jackson?

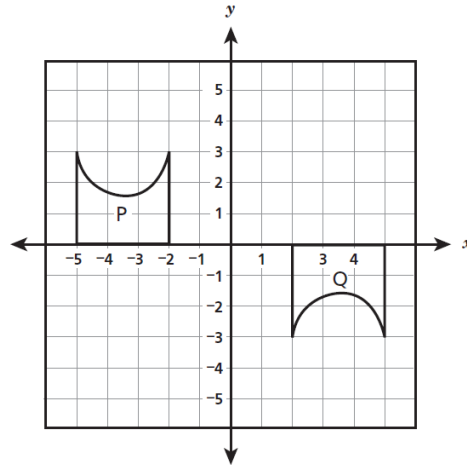
- a. 25 miles
 - b. 50 miles
 - c. 100 miles
 - d. 200 miles
- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.
 - https://www.smarterbalanced.org/wp-content/uploads/2015/11/G8_Practice_Test_Scoring_Guide_Math.pdf, © Smarter Balanced Assessment Consortium, 2013 Descriptions of the operation of the Test Delivery System, Test Information Distribution Engine, and related systems are property of the American Institutes for Research® (AIR) and are used with permission of AIR.

Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4

Engage NY, Smarter Balance

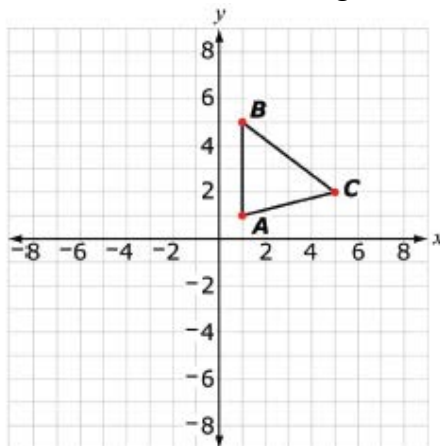
Day 2 Items

1. Figure Q was the result of a sequence of transformations on figure P, both shown below.



Which sequence of transformations could take figure P to figure Q?

- reflection over the x -axis and translation 7 units right
 - reflection over the y -axis and translation 3 units down
 - translation 1 unit right and 180° rotation about the origin
 - translation 4 units right and 180° rotation about the origin
2. Triangle ABC is shown on this coordinate grid.



Triangle ABC is dilated with the origin as the center of the dilation. Which ordered pair could represent the image of point $C(5, 2)$ after the dilation?

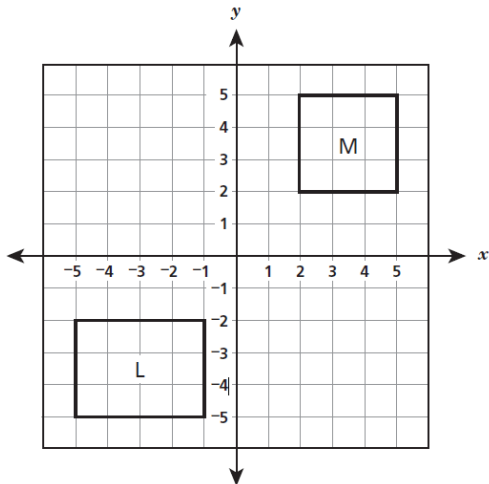
- $(2.5, 1)$
 - $(5, -2)$
 - $(7.5, 4.5)$
 - $(-1, -4)$
- <https://www.engageny.org/resource/new-york-state-common-core-sample-questions>, Engage NY
 - https://www.smarterbalanced.org/wp-content/uploads/2015/11/G8_Practice_Test_Scoring_Guide_Math.pdf, © Smarter Balanced Assessment Consortium, 2013 Descriptions of the operation of the Test Delivery System, Test Information Distribution Engine, and related systems are property of the American Institutes for Research® (AIR) and are used with permission of AIR.

Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4 (Continued)

Engage NY, Smarter Balance

Day 2 Items

3. Figure L and figure M are shown on the grid below.



Maria wants to transform figure L to figure M using only rotations, reflections, and translations. Which statement is true?

- a. The transformation can be done with a reflection followed by a rotation.
- b. The transformation can be done with a reflection followed by a translation.
- c. The transformation cannot be done because figure L is not congruent to figure M.
- d. The transformation cannot be done because figures L and M are in different quadrants.

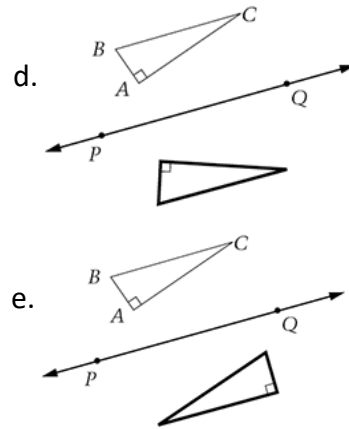
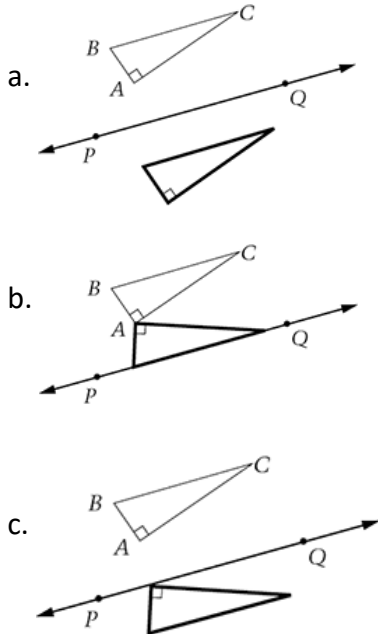
- <https://www.engageny.org/resource/new-york-state-common-core-sample-questions>, Engage NY
- https://www.smarterbalanced.org/wp-content/uploads/2015/11/G8_Practice_Test_Scoring_Guide_Math.pdf, © Smarter Balanced Assessment Consortium, 2013 Descriptions of the operation of the Test Delivery System, Test Information Distribution Engine, and related systems are property of the American Institutes for Research® (AIR) and are used with permission of AIR.

Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4

NAEP Questioning Tool

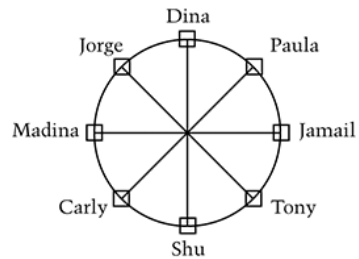
Day 3 Items

1. Which of the following figures shows the reflection of triangle ABC over line PQ ?



2. The figure above shows a Ferris wheel stopped with Dina at the top. Who will be at the top after a 135° clockwise rotation?

- a. Tony
- b. Carly
- c. Madina
- d. Jorge
- e. Paula



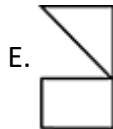
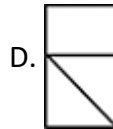
Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4 (Continued)

NAEP Questioning Tool

Day 3 Items



3. When the figure above is rotated 90 degrees clockwise, which of the following is the resulting figure?



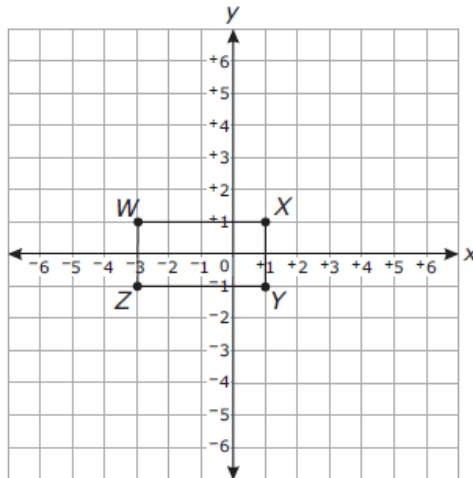
Name _____

Date _____

Set 1 - Standard(s): 8.G.3

North Carolina, NAEP Questioning Tool, Smarter Balance

Day 4 Items



1. Rectangle $WXYZ$ above will be dilated by a scale factor of $\frac{1}{2}$, creating rectangle $W'X'Y'Z'$. What will be the perimeter of rectangle $W'X'Y'Z'$?
 - a. 4 units
 - b. 6 units
 - c. 12 units
 - d. 24 units

2. The point $(3, 7)$ is a vertex of a triangle. When the triangle is reflected over the y -axis, what are the coordinates of the image of the vertex?
 - a. $(-3, -7)$
 - b. $(-3, 7)$
 - c. $(3, -7)$
 - d. $(3, 7)$
 - e. $(7, 3)$

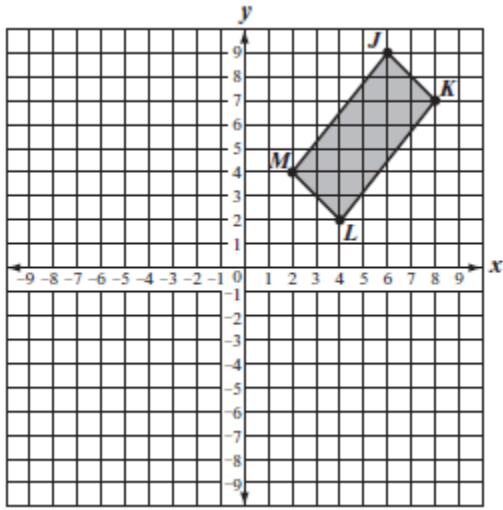
- <http://www.ncpublicschools.org/docs/accountability/testing/releasedforms/g8mathpp.pdf>, North Carolina Department of Public Instruction
- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011, 2013 Mathematics Assessment.
- https://www.smarterbalanced.org/wp-content/uploads/2015/11/G8_Practice_Test_Scoring_Guide_Math.pdf, © Smarter Balanced Assessment Consortium, 2013 Descriptions of the operation of the Test Delivery System, Test Information Distribution Engine, and related systems are property of the American Institutes for Research® (AIR) and are used with permission of AIR.

Set 1 - Standard(s): 8.G.3 (Continued)

North Carolina, NAEP Questioning Tool, Smarter Balance

Day 4 Items

3. Quadrilateral $JKLM$ is shown on the coordinate grid below.



Quadrilateral $JKLM$ will be reflected over the x -axis to create its image, quadrilateral $J'K'L'M'$. What will be the x -coordinate of vertex K' ?

- a. -8
- b. -7
- c. 7
- d. 8

- <http://www.ncpublicschools.org/docs/accountability/testing/releasedforms/g8mathpp.pdf>, North Carolina Department of Public Instruction
- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011, 2013 Mathematics Assessment.
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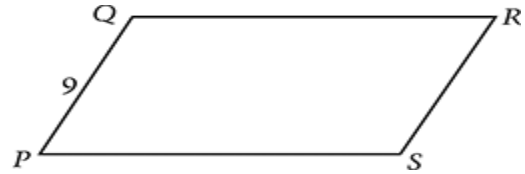
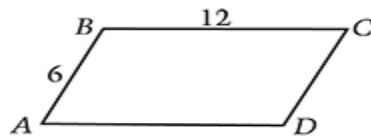
Name _____

Date _____

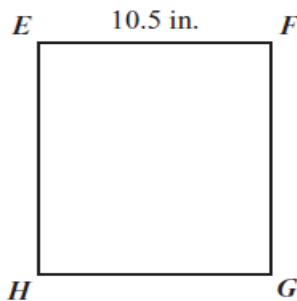
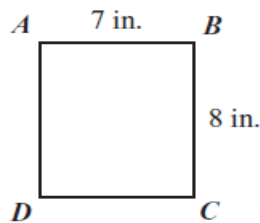
Set 1 - Standard(s): 8.G.1, 8.G.4

NAEP Questioning Tool, Massachusetts

Day 5 Items

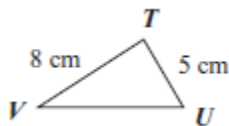
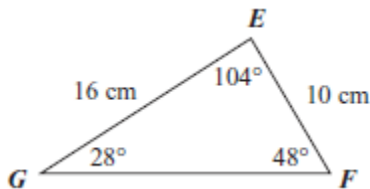


1. Parallelograms $ABCD$ and $PQRS$ above are similar. What is the length of side QR ?
 - a. 4.5
 - b. 9
 - c. 12
 - d. 15
 - e. 18
2. Rectangle $ABCD$ is similar to rectangle $EFGH$. The rectangles and some of their dimensions are shown in the diagram below.



Based on the diagram, what is the length, in inches, of side FG ?

3. Triangle EFG is similar to triangle TUV , as shown below.



Based on the measurements of the triangles, what is the measure of angle U ?

- a. 24°
 - b. 28°
 - c. 48°
 - d. 52°
- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011, 2013 Mathematics Assessment.
 - <http://www.doe.mass.edu/mcas/> - Massachusetts Department of Elementary and Secondary Education, Permission is hereby granted to copy for non-commercial educational purposes any or all parts of this document. Please credit the "Massachusetts Department of Elementary and Secondary Education."

Set 1 - Standard(s): 7.G.1, 7.G.4

NAEP Questioning Tool, Smarter Balance

Day 1 Items - KEY

1. 14 cm^2
2. B
3. D

- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Mathematics Assessment.
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Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4

Smarter Balance, Engage NY

Day 2 Items - KEY

1. A
2. A

Key and Distractor Analysis:

- A. Key
- B. Students may confuse dilation with reflection.
- C. Students may think that you can add the same amount from each coordinate when dilating.
- D. Students may think that you can subtract the same amount from each coordinate when dilating.

3. C

- <https://www.engageny.org/resource/new-york-state-common-core-sample-questions>, Engage NY
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Set 1 - Standard(s): 8.G.2, 8.G.3, 8.G.4

NAEP Questioning Tool

Day 3 Items - KEY

1. D
2. B
3. A

- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009, 2011, 2013 Mathematics Assessment.

Set 1 - Standard(s): 8.G.3

NAEP Questioning Tool, Smarter Balance, North Carolina

Day 4 Items - KEY

1. B
2. B
3. D

- <http://www.ncpublicschools.org/docs/accountability/testing/releasedforms/g8mathpp.pdf>, North Carolina Department of Public Instruction
- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011, 2013 Mathematics Assessment.
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Set 1 - Standard(s): 8.G.1, 8.G.4

NAEP Questioning Tool, Massachusetts

Day 5 Items - KEY

1. E
2. 12 inches
3. C

- NAEP Questioning Tool - <http://nces.ed.gov/nationsreportcard/nqt/>, SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2011, 2013 Mathematics Assessment.
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