WALCH EDUCATION

Daily Warm-Ups GEOMETRY

Common Core State Standards

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Introduction

Daily Warm-Ups: Geometry, Common Core State Standards is organized into five sections, composed of the domains of the Geometry high school conceptual category designated by the Common Core State Standards Initiative. Each warm-up addresses one or more of the standards within these domains.

The Common Core Mathematical Practices standards are another focus of the warm-ups. All the problems require students to "make sense of problems and persevere in solving them," "reason abstractly and quantitatively," and "attend to precision." Many of the warm-ups ask students to develop careful proofs. Students must "use more precise definitions" when proving relationships described. Further, the "correspondence between numerical coordinates and geometric points allows methods from algebra to be applied to geometry." A full description of these standards can be found at www.corestandards.org/the-standards/mathematics/introduction/standards-for-mathematical-practice/.

The warm-ups are organized by standard rather than by level of difficulty. Use your judgment to select appropriate problems for your students.* The problems are not meant to be completed in consecutive order—some are stand-alone, some can launch a topic, some can be used as journal prompts, and some refresh students' skills and concepts. All are meant to enhance and complement high school geometry programs. They do so by providing resources for teachers for those short, 5-to-15-minute interims when class time might otherwise go unused.

*** You may select warm-ups based on particular standards using the Standards Correlations document on the accompanying CD.**

Daily Warm-Ups: Geometry, Common Core State Standards

About the CD-ROM

Daily Warm-Ups: Geometry, Common Core State Standards is provided in two convenient formats: an easy-to-use, reproducible book and a ready-to-print PDF on a companion CD-ROM. You can photocopy or print activities as needed, or project them on a large screen via your computer.

The depth and breadth of the collection give you the opportunity to choose specific skills and concepts that correspond to your curriculum and instruction. The activities address the Geometry Common Core State Standards for high school mathematics. Use the table of contents, the title pages, and the standards correlations provided on the CD-ROM to help you select appropriate tasks.

Suggestions for use:

- Choose an activity to project or print out and assign.
- Select a series of activities. Print the selection to create practice packets for learners who need help with specific skills or concepts.

Part 1: Congruence

Overview

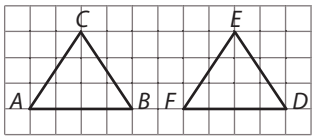
Congruence

- Experiment with transformations in the plane.
- Understand congruence in terms of rigid motions.
- Prove geometric theorems.
- Make geometric constructions.

Transformations: Translations

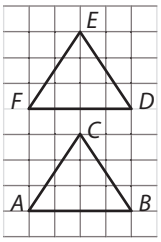
A **translation**, or a slide, is the movement of a figure from one position to another without turning. To the right are examples of a horizontal slide and a vertical slide.

horizontal slide



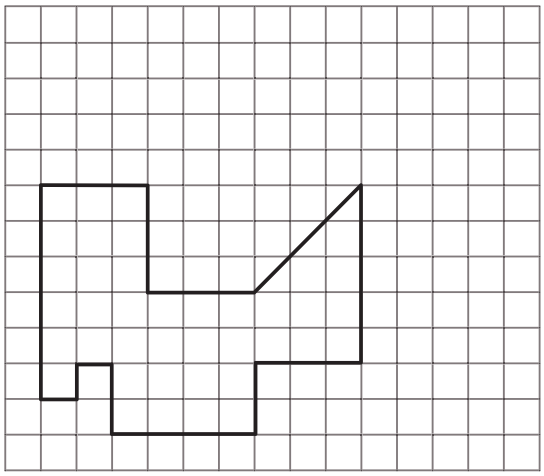
6 units to the right

vertical slide



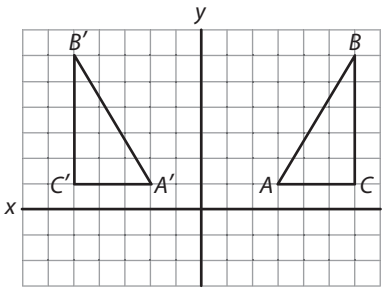
4 units up

Look at the figure below. Slide the figure 4 units to the right and 4 units up. Draw the image on the graph.

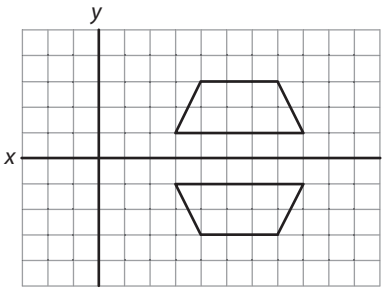


Transformations: Reflections

When a figure is flipped over a line, the mirror image produced is a **reflection.** On the right are two examples of reflections.



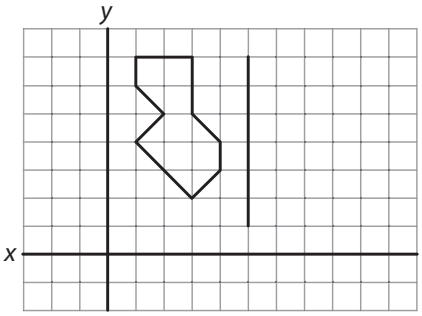
The triangle is reflected across the *y*-axis.



The trapezoid is reflected across the *x*-axis.

2

Look at the figure to the right. Reflect the figure across the indicated line of symmetry. Draw the image on the graph.



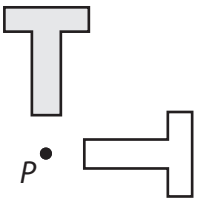
Transformations: Rotations

When you rotate a figure, you turn or spin the figure around a fixed point, the center of rotation.

Example

Rotate the letter *T* 90° at point *P*.

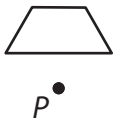
The shaded figure is the original figure.
The unshaded figure is the rotated figure.



Rotate each figure below about point *P* by the measure indicated.

1. Rotate the figure 45°.

2. Rotate the figure 180°.



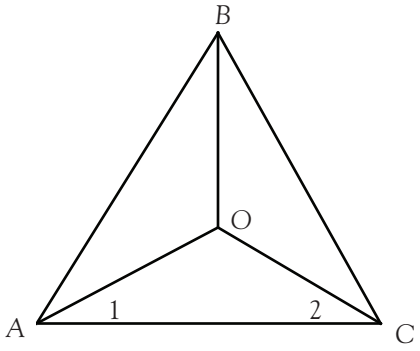
Proof and the Isosceles Triangle

In the diagram below, use what you know about isosceles triangles and congruence to prove that $m\angle 1 = m\angle 2$.

Given: $AB = CB$

BO bisects $\angle ABC$ ($m\angle ABO = m\angle CBO$)

Prove: $m\angle 1 = m\angle 2$



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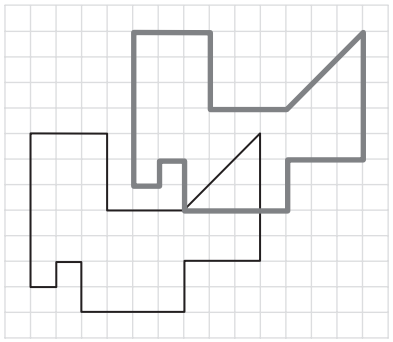
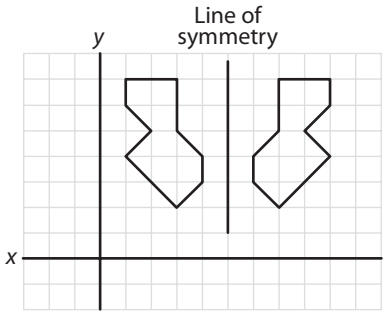
Part 1: Congruence

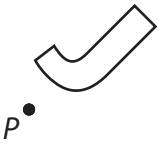
1.



2.



3. 1.



2.

4.

Statement	Reason
1. $AB = CB$	Given
2. $\overline{BO}$ bisects $\angle ABC$.	Given
3. $m\angle ABO = m\angle CBO$	Definition of $\angle$ bisection
4. $BO = BO$	Reflexive property
5. $\Delta COB \cong \Delta AOB$	SAS
6. $CO = AO$	CPCT
7. $m\angle 1 = m\angle 2$	2 = sides → 2 = $\angle$'s

5.

Statement	Reason
1. $LO = LR$	Given
2. $RI = OI$	Given
3. $LI = LI$	Reflexive property
4. $\Delta LOI \cong \Delta LRI$	SSS
5. $m\angle LOI = m\angle LRI$	CPCT