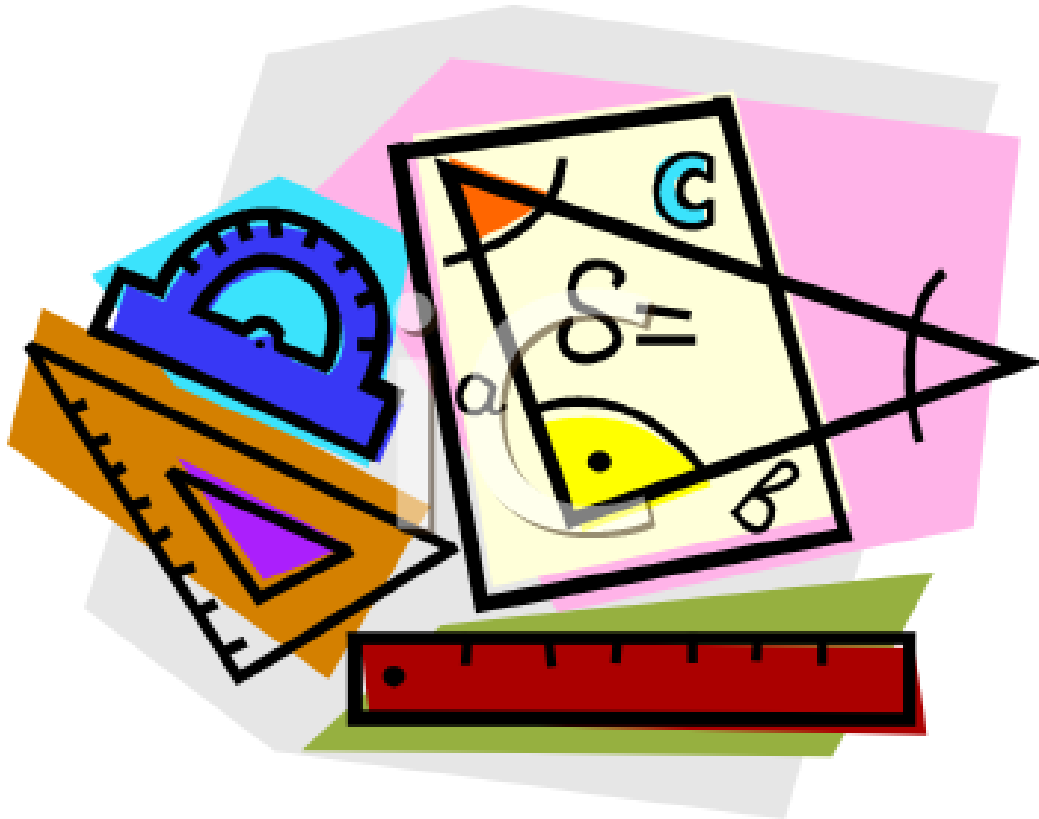


# Summer Enrichment Packet for Rising Geometry Students



PRINCE GEORGE'S COUNTY PUBLIC SCHOOLS  
Division of Academics  
Department of Curriculum and Instruction



**BOARD OF EDUCATION  
OF  
PRINCE GEORGE'S COUNTY, MARYLAND**

**Alvin Thornton, Ph.D., *Chair***

**Edward Burroughs III, *Vice-Chair, District 8***

**David Murray, *District 1***

**Joshua M. Thomas, *District 2***

**Pamela Boozer-Strother, *District 3***

**Bryan Swann, *District 4***

**Raaheela Ahmed, *District 5***

**Belinda Queen, *District 6***

**K. Alexander Wallace, *District 7***

**Sonya Williams, *District 9***

**Curtis Valentine, M.P.P., *Board Member***

**Paul Monteiro, *Board Member***

**Sandra D. Shephard, *Board Member***

**Joshua Omolola, *Student Board Member***

**Monica E. Goldson, Ed.D., *Secretary/Treasurer and Chief Executive Officer***

---

**Kara Libby, Ed.D.**  
*Chief Academic Officer*

**Judith J. White, Ed.D.**  
*Director, Curriculum and Instruction*

**Ms. Stephanie McLeod**  
*Instructional Supervisor, High School Mathematics*

## Summer Enrichment Packet for Rising Geometry Students

---

### **Note to the Student:**

In middle school, you worked with a variety of geometric measures, such as: length, area, volume, angle, surface area, and circumference. Rotation, reflection, and translation were treated with an emphasis on geometric intuition. In Grade 8, you learned the Pythagorean Theorem and used it to determine distances in a coordinate system. In high school Geometry, you will apply these component skills in tandem with others in the course of modeling tasks and other applications. Therefore, it is important that you keep practicing your mathematical knowledge over the summer to prepare yourself for Geometry. In this packet, you will find weekly activities for the summer break.

### **Directions:**

- Create a personal and fun math journal by stapling several pieces of paper together or use a notebook or binder with paper. Be creative and decorate the cover to show math in your world.
  
- Each journal entry should:
  - ❖ Have the week number and the activity number.
  - ❖ Have a clear and complete answer that explains your thinking.
  - ❖ Be neat and organized.

Playing board and card games are a good way to reinforce basic computation skills and mathematical reasoning. Try to play board and card games at least once a week. Some suggested games to play are: Monopoly, Chess, War, Battleship, Mancala, Dominoes, Phase 10, Yahtzee, 24 Challenge, Sudoku, Connect Four, and Risk.

### **Where to Go to Get Help and Opportunities for Practice!**

During the course of your math work this summer, you may need some assistance with deepening your understanding the skills and concepts. You also might want to get some more practice. Here are some sites you can visit online:



To get the exact definition of each standard, go to [www.corestandards.org](http://www.corestandards.org) and search for the content standard (for example, *HSF.BF.1.3*).



***Khan Academy*** has helpful videos and self-guided practice problems for every grade level. Go to [www.khanacademy.org](http://www.khanacademy.org) to get started.

# Summer Enrichment Packet for Rising Geometry Students

---

## Week 1

**Domain:** *Geometry*

**Standard: 8.G.7**– Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.

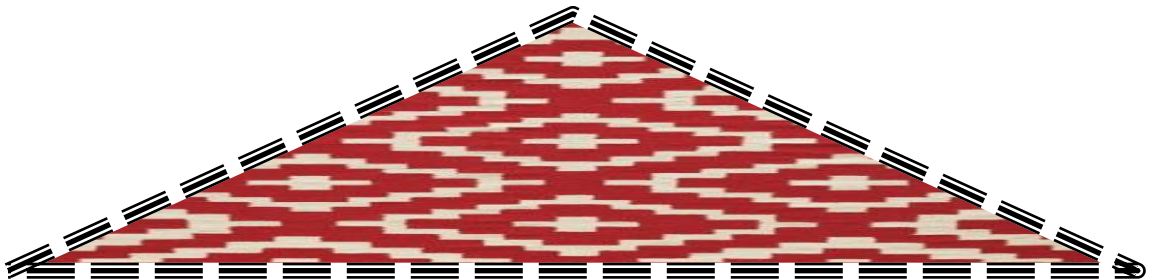
### Directions:

Gloria works at a factory that makes rugs. The edge of each rug is bound with a braid. Gloria’s job is to cut the correct length of braid for each rug.

1. The factory makes a rectangular rug that is 4 feet long and 2 feet 6 inches side. How much braid will Gloria need to go all the way around the rug?



2. The factory also makes a triangular rug. It is an isosceles triangle 5 feet wide with a perpendicular height of 1 foot 6 inches. How much braid will Gloria need to cut to go all the way around the rug?



## Summer Enrichment Packet for Rising Geometry Students

---

3. The factory also makes a circular rug that has a diameter of 5 feet. How much braid will Hank need to go all the way around the circular rug? Give your answer in whole feet.



4. There are plans to make a semi-circular rug, which also has a diameter of 5 feet. Gloria thinks that this rug will need half as much braid as the circular rug. Explain why Gloria is not correct. How much braid will this rug need?

# Summer Enrichment Packet for Rising Geometry Students

---

## Week 2

**Domain:** *Geometry*

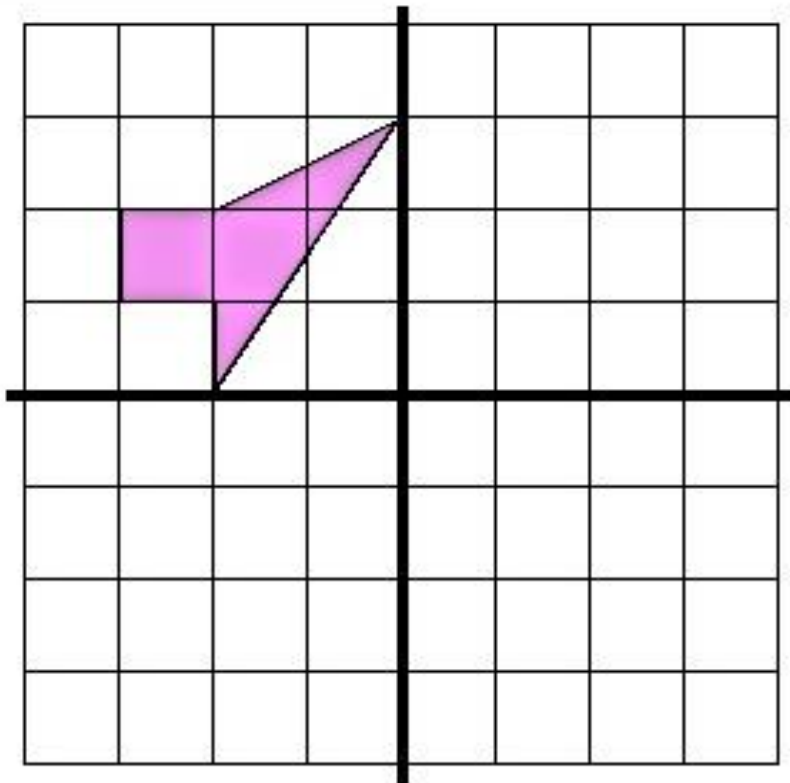
**Standard:** 8.G.3 – Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.



**Directions:**

Andre is drawing some designs for greetings cards. He divides a grid into four quadrants and starts by drawing a shape in one quadrant. He then reflects, rotates, or translates the shape into the other three quadrants.

1. Finish Andre's first design by reflecting the shape over the vertical line. Then, reflect both of the shapes over the horizontal line. This will make a design in all four quadrants.





## Summer Enrichment Packet for Rising Geometry Students

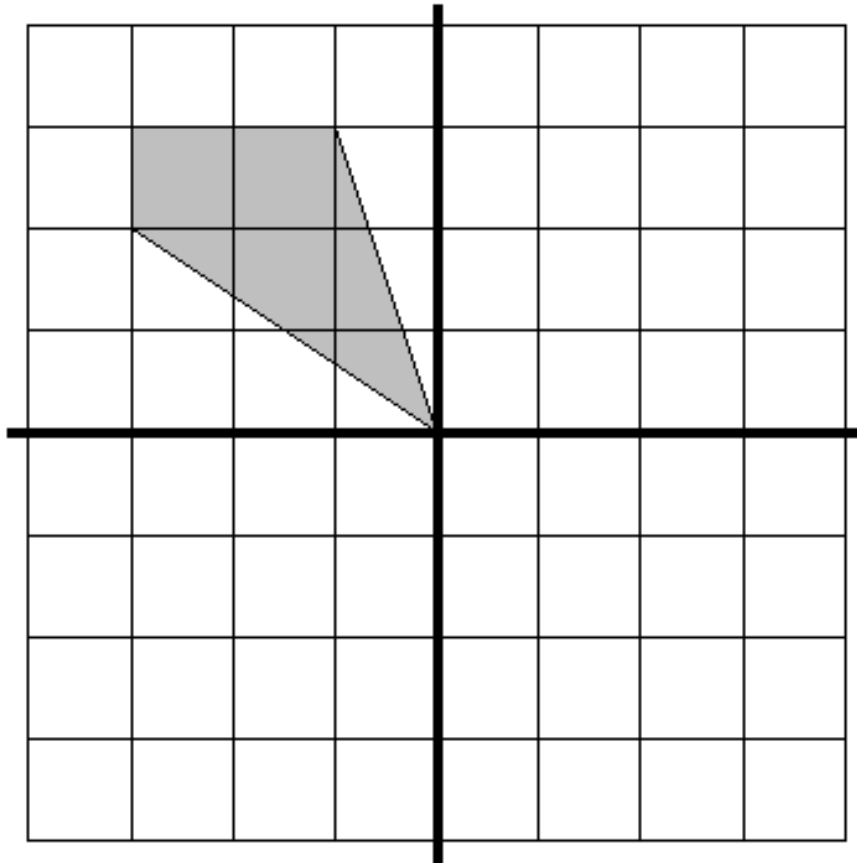
---

2. To finish drawing Andre's second design, rotate the shape  $\frac{1}{4}$  of a turn in a clockwise direction about the origin. Then draw the second shape.

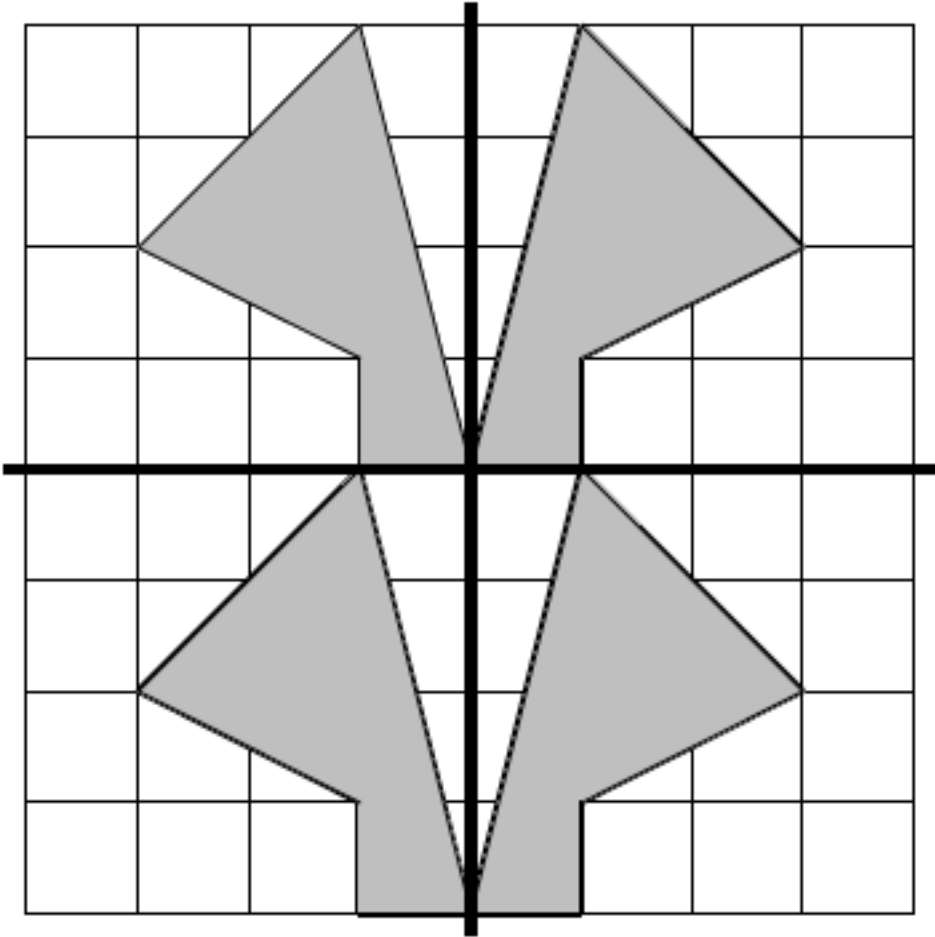
Rotate the second shape  $\frac{1}{4}$  of a turn in a clockwise direction about the origin. Then draw the third shape.

Rotate the third shape  $\frac{1}{4}$  of a turn in a clockwise direction about the origin. Then draw the fourth shape.

This will make a design in all four quadrants.



3. Below is Andre's third design. He started with a shape in quadrant IV of the grid and transformed it to make the design. Describe the transformation that Andre may have used to draw his design.



# Summer Enrichment Packet for Rising Geometry Students

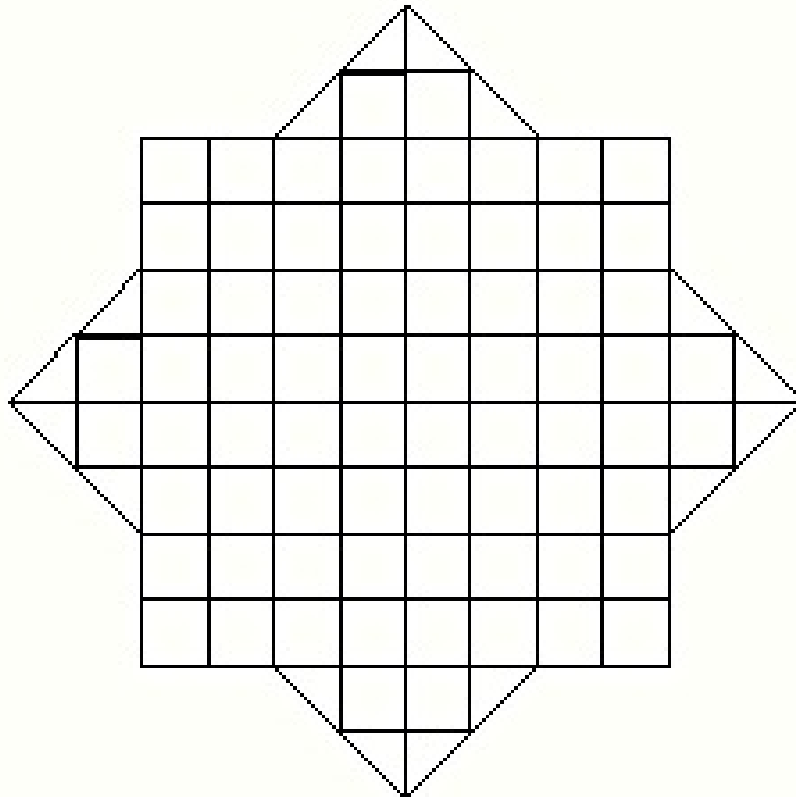
## Week 3

Domain: *Geometry*



**Standard: 8.G.7** – Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.

Andros is an ancient city in Russia where some of the sidewalks are made from small square blocks, 5 cm by 5 cm. The blocks are in different shades to make patterns. Below is one of the patterns they make. Find the area and perimeter of the pattern. Show your work. Round to the nearest whole number.



## Summer Enrichment Packet for Rising Geometry Students

---

### Week 4

**Domain:** *Geometry*



**Standard: 7.G.6** – Solve real world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**Directions:** This summer, you are working with a world-famous sports distributor. They have asked you to design a sports bag they will sell in the fall. The bag must meet the following criteria.

- The length of the will bag will be 60 cm.
  - The bag will have circular ends of diameter 25 cm.
  - The main body of the bag will be made of 3 pieces of material (a piece for the curved body and two circular end pieces).
  - Each piece will need to have an extra 2 cm all around it for a seam, so that the pieces may be stitched.
1. Make a sketch of the pieces you will need to cut out for the body of the bag. Your sketch does not have to be to scale. On your sketch, show all the measurements you will need.
  
  2. Find the total area of material you will need to create your bag.

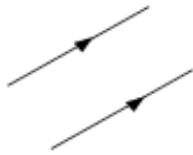
# Summer Enrichment Packet for Rising Geometry Students

## Week 5

**Domain:** *Geometry*

**Standard: 8.G** – Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

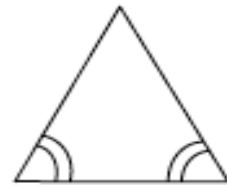
**Directions:** Use the diagram below to remind you of markings and their meanings.



These lines are **parallel**

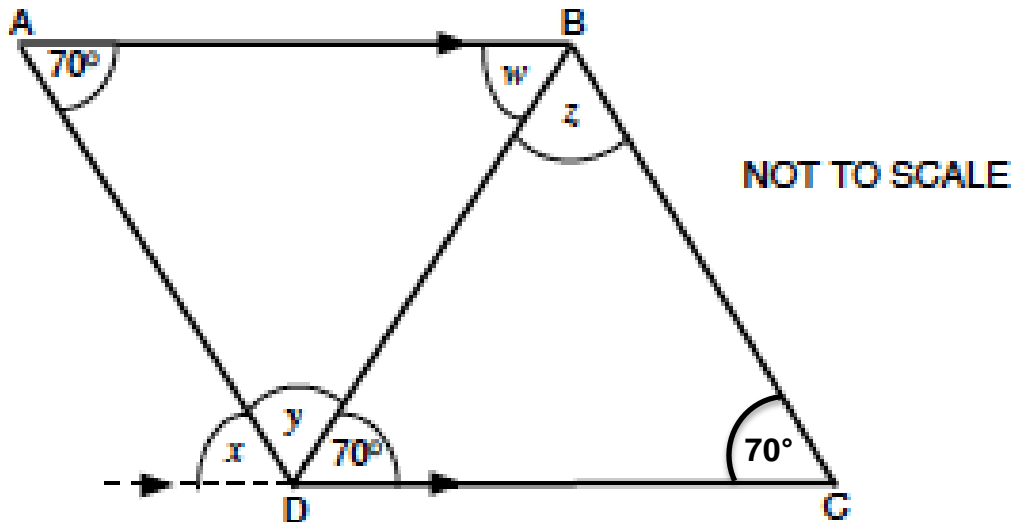


These lengths are **congruent**



These angles are **congruent**

1. In the diagram below, two  $70^\circ$  angles have been labeled. Four other angles are labeled  $w$ ,  $x$ ,  $y$ , and  $z$ .



## Summer Enrichment Packet for Rising Geometry Students

---

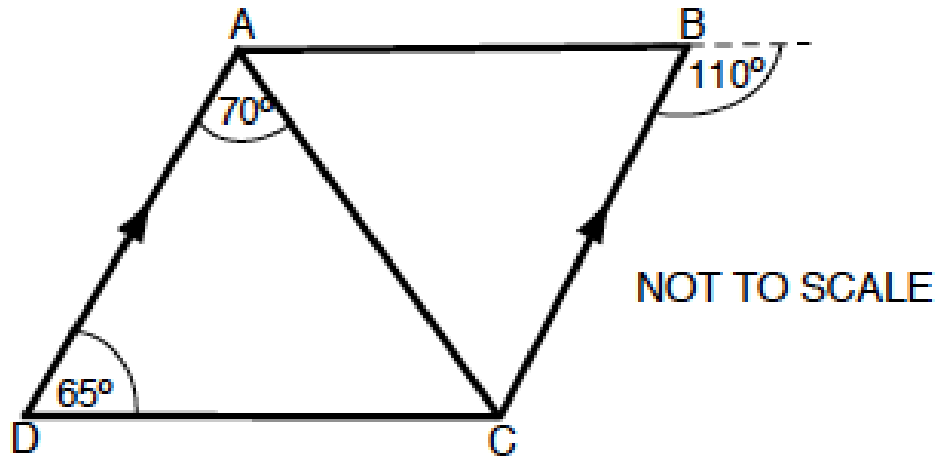
Complete the table below.

Angle	Determine the measure of the given angle.	Explain carefully how you determined the angle measure.
$w$		
$x$		
$y$		
$z$		

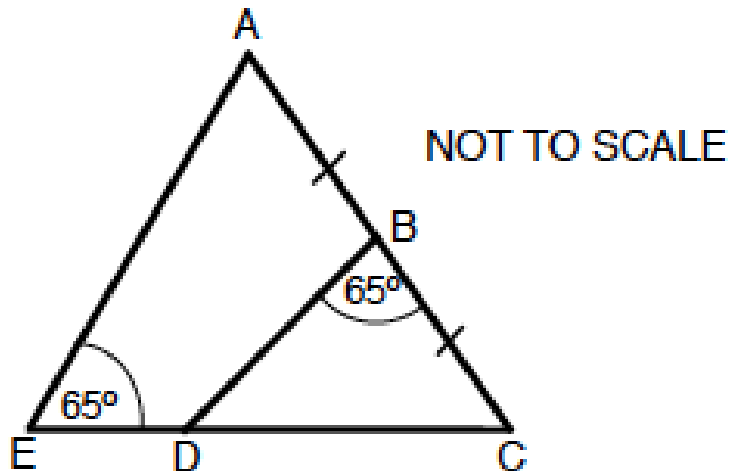
## Summer Enrichment Packet for Rising Geometry Students

---

2. The diagram below shows two triangles, triangle ABC and triangle ACD. Explain how you will determine if the two triangles are similar.



3. The diagram below shows triangle BCD within triangle ACE. Explain how you will determine if the two triangles are similar.



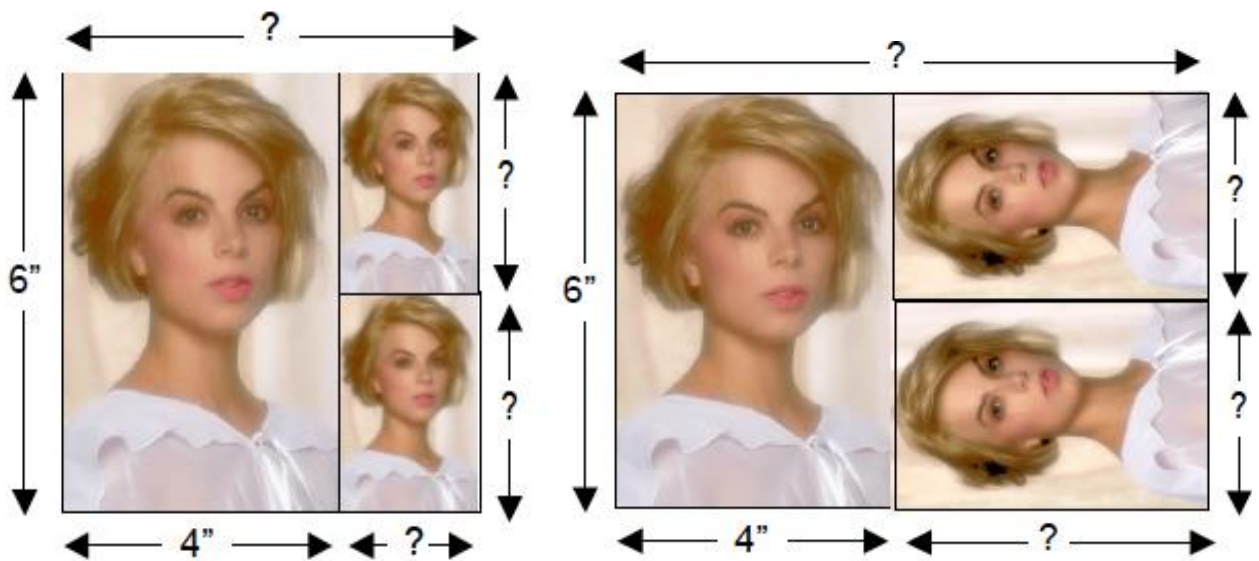
# Summer Enrichment Packet for Rising Geometry Students

## Week 6

**Domain:** *Geometry*

**Standard:** **7.G** – Draw, construct, and describe geometrical figures and describe the relationship between them.

**Directions:** A photographer wants to print a photograph and two smaller copies on the same rectangular sheet of paper. The photograph is 4 inches wide and 6 inches high. The diagrams are not drawn to actual size.



**Sheet 1**

**Sheet 2**

1. Explain how to find the measurements of the small photographs for each sheet.
2. Find the size of the sheet of paper for each arrangement.



## Summer Enrichment Packet for Rising Geometry Students

---

### Week 7

**Domain:** *Geometry*

**Standard:** 8.G.6-8.G.9 – Understand and apply Pythagorean Theorem.

**Directions:** Sean and Kenny are actors at the local theater. Sean lives 5 miles from the theater and Kenny lives 3 miles from the theater. Their boss wonders how far apart the actors live from the theater.

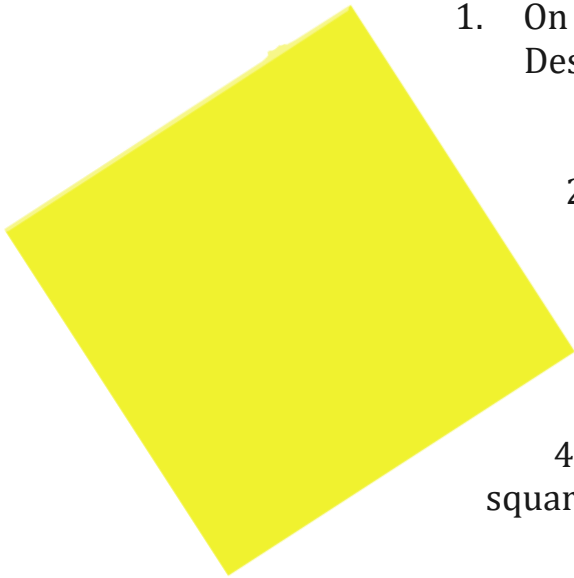


- **On graph paper, pick a point to represent the location of the theater.**
  - **Illustrate all of the possible places Sean could live on the graph paper.**
  - **Using a different color, illustrate all of the possible places that Kenny could live on the grid paper.**
1. On your graph paper, label the  $x$  and  $y$ -axes of the grid. You are going to plot each scenario on this one grid.
  2. Use Pythagorean Theorem, when possible, to compute the distance between Sean's and Kenny's home.
  3. What is the smallest and largest distance Sean and Kenny live from each other? How do you know?
  4. If Sean lived 5 miles north of the theater and Kenny 3 miles west, what is the shortest distance between their homes?

### Geometry – Unit 1 Preview

**Standard: G.CO.2** – Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle measures to those that do not (e.g., translation versus horizontal stretch).

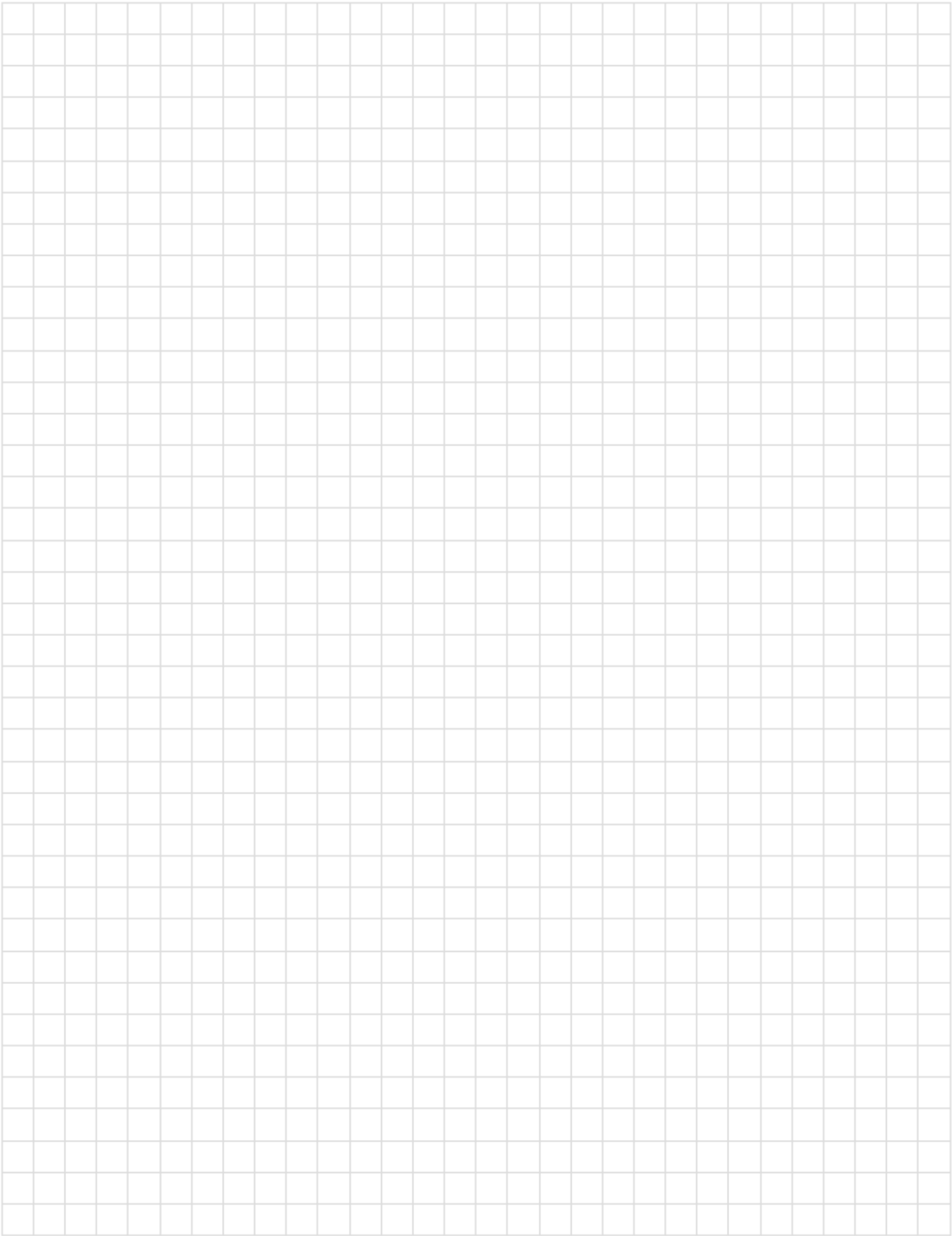
#### Part I



1. On a piece of graph paper, draw and label a square. Describe its original position and size.
2. Rotate it  $90^\circ$  clockwise around any point.
3. Translate it so that it is in the 4th quadrant.
4. Reflect it over a line  $y = \text{"a number"}$  so that the square is in the 1st quadrant.
5. Write two different ways that you can get the shape back in its original position.

**Summer Enrichment Packet for Rising Geometry Students**

---



### **Part II**

6. On your graph paper, draw and label a triangle. Describe its original position and size.

7. Rotate, translate, and/or reflect the triangle so that the two triangles create a parallelogram. List your steps.

