

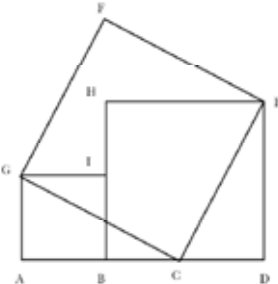


HIGH SCHOOL GEOMETRY: COMPANY LOGO RUBRIC

The rubric section contains a scoring guide and performance level descriptions for the Company Logo task.

Scoring Guide: The scoring guide is designed specifically to each small performance task. The points highlight each specific piece of student thinking and explanation required of the task and help teachers see common misconceptions (which errors or incorrect explanations) keep happening across several papers. The scoring guide can then be used to refer back to the performance level descriptions.

Performance Level Descriptions: Performance level descriptions help teachers think about the overall qualities of work for each task by providing information about the expected level of performance for students. Performance level descriptions provide score ranges for each level, which are assessed using the scoring guide.

The Company Logo	Rubric	
<p>The elements of performance required by this task are:</p> <ul style="list-style-type: none"> • Visualizes geometric shapes, identifies plane figures and their attributes, proves triangles are congruent, determines the area relationships of quadrilaterals, makes geometric conjectures and proves/justifies geometric arguments. 	Points	Section Points
<p>1. There are three squares.</p> <p>Describes the square such as: The figure contains a small square $\square ABIG$ that shares an adjacent side with a medium size square $\square BDEH$. There is a large square $\square CEFH$ that intersects the small square at vertex G and the medium square at vertex E and point C.</p> 	1 1	2
<p>2. The two triangles are congruent ($\triangle ACE = \triangle DEC$).</p> <p>Justifies answer such as: Both triangles $\triangle ACE$ and $\triangle DEC$ are right triangles because they share an angle with a square, $\angle A$ and $\angle D$. Both hypotenuses are congruent because they both share a side of the large triangle, $GC = CE$. $\angle CED = \angle GCA$ because they are both complements of the same angle, $\angle ECD$. Therefore the two triangles are congruent by the Hypotenuse Angle Theorem.</p> <p><i>Partial Credit</i> Some correct geometric reasoning</p>	1 3 (1)	4
<p>3. The sum of the areas of the two smaller squares is equal area of the largest square.</p> <p>Justify their conjecture such as: From part two, $\triangle ACE = \triangle DEC$. Therefore in both triangles the small leg is the length of the small square, the other leg is the length of the medium square, and the hypotenuse is the length of the large square. Using the Pythagorean Theorem the sum of area of the two squares (small and medium) equals the area of the largest square.</p> <p>Accept proof that two outside triangles fit exactly inside large square along with the remaining parts of the smaller square, either through transformations or Euclidean theorems.</p>	1 3	4
Total Points		10

High School Geometry: Company Logo Rubric

Performance Level Descriptions and Cut Scores

Performance is reported at four levels: 1 through 4, with 4 as the highest.

Level 1: Demonstrates Minimal Success (0-2 points)

The student's response shows few of the elements of performance that the tasks demand. The work shows a minimal attempt on the problem and struggles to make a coherent attack on the problem. Communication is limited and shows minimal reasoning. The student's response rarely uses definitions in their explanations. The student struggles to recognize patterns or the structure of the problem situation.

Level 2: Performance Below Standard (3-4 points)

The student's response shows some of the elements of performance that the tasks demand and some signs of a coherent attack on the core of some of the problems. However, the shortcomings are substantial and the evidence suggests that the student would not be able to produce high-quality solutions without significant further instruction. The student might ignore or fail to address some of the constraints. The student may occasionally make sense of quantities in relationships in the problem, but their use of quantity is limited or not fully developed. The student's response may not state assumptions, definitions, and previously established results. While the student makes an attack on the problem it is incomplete. The student may recognize some patterns or structures, but has trouble generalizing or using them to solve the problem.

Level 3: Performance at Standard (5-6 points)

For most of the task, the student's response shows the main elements of performance that the tasks demand and is organized as a coherent attack on the core of the problem. There are errors or omissions, some of which may be important, but of a kind that the student could fix with more time for checking and revision and some limited help. The student explains the problem and identifies constraints. Student makes sense of quantities and their relationships in the problem situations. They often use abstractions to represent a problem symbolically or with other mathematical representations. The student may use assumptions, definitions, and previously established results in constructing arguments. They may make conjectures and build a logical progression of statements to explore the truth of their conjectures. The student might discern patterns or structures and make connections between representations.

Level 4: Achieves Standards at a High Level (7-10 points)

The student's response meets the demands of nearly all of the task, with few errors. With some more time for checking and revision, excellent solutions would seem likely. The student response shows understanding and use of stated assumptions, definitions and previously established results in construction arguments. The student is able to make conjectures and build a logical progression of statements to explore the truth of their conjecture. The student routinely interprets their mathematical results in the context of the situation and reflects on whether the results make sense. The communication is precise, using definitions clearly. Student looks closely to discern a pattern or structure. The body of work looks at the overall situation of the problem and process, while attending to the details.



HIGH SCHOOL GEOMETRY: COMPANY LOGO STUDENT WORK

High School Geometry: Company Logo

Student Work

Student A

A company has designed a new logo using overlapping squares.

1. How many squares do you see in the logo? 3

Describe where you see the squares.
two squares next to each other and a diagonal overlapping square.

2. The logo designer colored two triangles in the logo.
 How are the two triangles related?
 Justify your answer.

the 2 Δ are \cong

$\overline{GC} \cong \overline{EC}$ sides of \square
 $\angle GAB \cong \angle EDC$
right \angle
 $\angle GCA \cong \angle DEC$
 $\Delta GAC \cong \Delta ECD$
by AAS

$\angle EDC = 90^\circ$
 $\angle ECD = 90^\circ - x^\circ$
 $\angle ECG = 90^\circ$
 $\angle GCA = 180 - 90 - (90 - x) = x^\circ$
 $\angle DEC = x^\circ$

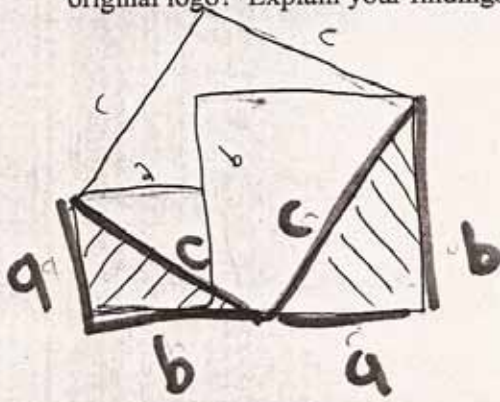
Performance Task P 1
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High School Geometry: Company Logo

Student Work

Student A (cont'd)

3. What are the relationships between the sizes of the three squares in the original logo? Explain your findings.



Since the 2 Δ are \cong
all side \cong ,
therefore $a^2 + b^2 = c^2$
[areas of the squares]

High School Geometry: Company Logo Student Work

Student B

1. How many squares do you see in the logo? three

Describe where you see the squares.

1. Bottom left corner, has one triangle and a quadrilateral (BCIH)
2. Right bottom to center of figure, has two triangles, a quad inside
3. Rotated square that runs through both squares. (AFJK) (GIEH)

2. The logo designer colored two triangles in the logo.

How are the two triangles related?
Justify your answer.

(The triangles are congruent)

<p style="text-align: center;">S</p> <ol style="list-style-type: none"> 1. BCIH, BDEA, GIEH are sq. 2. $\angle BCI \cong \angle FED$, $\angle GFE \cong \angle IES$ 3. $\overline{BD} \cong \overline{DE}$ 4. $\overline{BF} \parallel \overline{IE}$ 5. $\angle FDI \cong \angle DKR$ 6. $\overline{BF} \perp \overline{BK}$ 7. $\angle EFK$ is rt \angle 8. $\angle FDK \cong \angle BDF$ 	<p style="text-align: center;">R</p> <ol style="list-style-type: none"> 1. Given 2. All angles in \square are rt 3. Sides are \cong in \square 4. opp. sides \parallel in square 5. Alt. int. \angles \cong when parallel lines 6. Def \perp 7. Def \perp 8. All \angles \cong
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9. $\angle BDC \cong \angle EDC$ (Sub. prop)

10. $\triangle BCD \cong \triangle DEC$ (AAS)

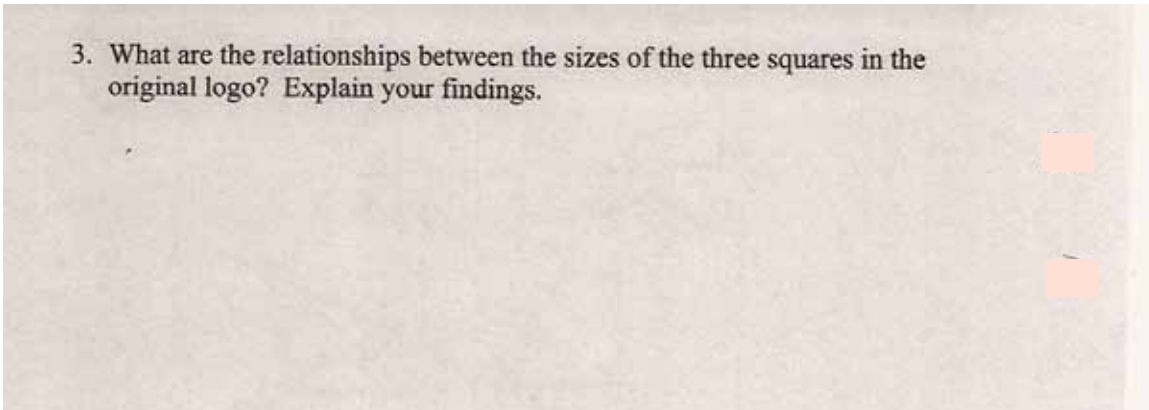
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Performance Task. The Company Logo

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High School Geometry: Company Logo
Student Work

Student B (cont'd)

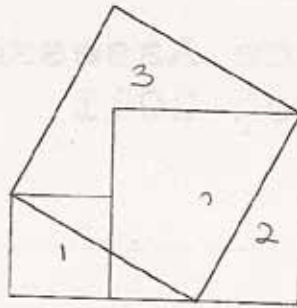


High School Geometry: Company Logo

Student Work

Student C

A company has designed a new logo using overlapping squares.



1. How many squares do you see in the logo? 3

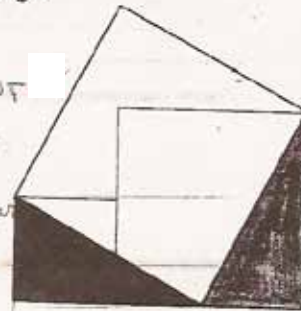
Describe where you see the squares.

There is one small square attached to a big similar square and a bigger square is bisecting both squares.

2. The logo designer colored two triangles in the logo.

How are the two triangles related?
Justify your answer.

The triangles are congruent because the length of the sides are equal and the angles are congruent.



High School Geometry: Company Logo

Student Work

Student C (cont'd)

3. What are the relationships between the sizes of the three squares in the original logo? Explain your findings.

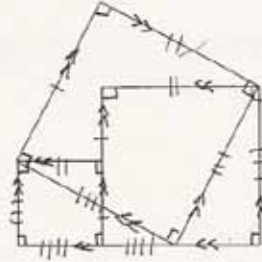
They're all similar but none of them are the same size. I have labeled the squares to make my explanation clearer. Square 2 is double the size of square 1 and ~~and~~ square 3 is 2.5 times larger than square 3.

High School Geometry: Company Logo

Student Work

Student D

A company has designed a new logo using overlapping squares.



1. How many squares do you see in the logo? 3

Describe where you see the squares.

bottom left corner, on the right of the left bottom square, middle of logo turned on it's side

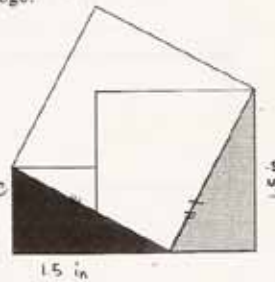
2. The logo designer colored two triangles in the logo.

How are the two triangles related?

Justify your answer.

Yes they are related to each other.

The grey triangle is the same as the black triangle, but it is turned ~~on its shortest side~~ on its longest side. The triangles are congruent.



3. What are the relationships between the sizes of the three squares in the original logo? Explain your findings.

All 3 squares have right angles, all the sides are congruent to each other, each side is parallel to each other.

High School Geometry: Company Logo

Student Work

Student E

Performance Task

The Company Logo

A company has designed a new logo using overlapping squares.

- How many squares do you see in the logo? 3

Describe where you see the squares.

2 squares next to each other, then one square goes through the 2 squares

- The logo designer colored two triangles in the logo.

How are the two triangles related?
Justify your answer.

They are both congruent to each other. Because the largest side on each triangle is a side on the square. The square has 4 congruent sides, the triangles also have right angles.

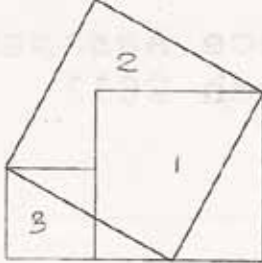
- What are the relationships between the sizes of the three squares in the original logo? Explain your findings.

~~on the left~~ \overline{VU} is a bisector from $\triangle WVS$
 \overline{YU} is a bisector from $\triangle XYZ$

High School Geometry: Company Logo Student Work

Student F

A company has designed a new logo using overlapping squares.



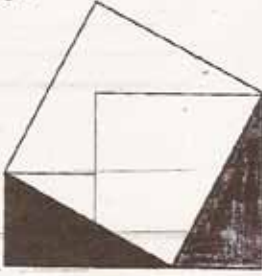
1. How many squares do you see in the logo? 3

Describe where you see the squares.
There is a square on the bottom left, and there is one next to it, and an overlapping them both.

2. The logo designer colored two triangles in the logo.

How are the two triangles related?
 Justify your answer.

They are both right isosceles triangles. they both are 45°. They both have 90° angles. as one side is extended there are 2



High School Geometry: Company Logo
Student Work

Student F (cont'd)

3. What are the relationships between the sizes of the three squares in the original logo? Explain your findings.

~~They are all the same size,~~
~~but different~~

The 3 squares
in the
original logo,
have ~~no~~ relationship,
they are
Different
Size's.

they have 2 equal
side's .
has 2 congruent
legs
2 equal
sides