

Geometry

2015 Winter Break Packet – Student



Department of Mathematics
Office of Academics and Transformation

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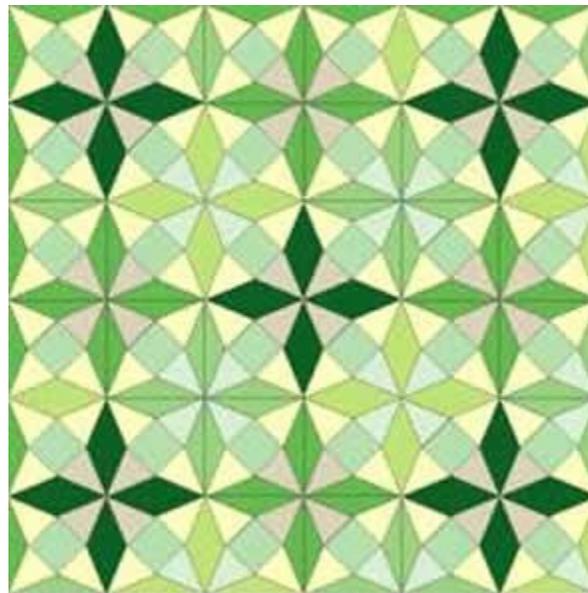
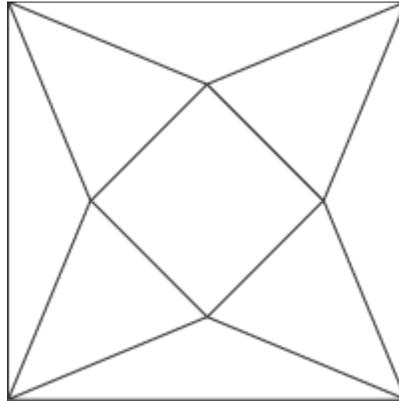
Department of Mathematics and Science

Congruency

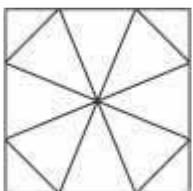
Task 1

Quilting is based on taking a small pattern and repeating it over and over again to make a more complicated pattern. Using different colored fabrics adds another level of complexity.

Part A: Study the basic square pattern used to make the quilt below. Look to see if you can locate where the basic units are in the finished pattern. Describe the transformations used to create the larger quilt based on the small square.



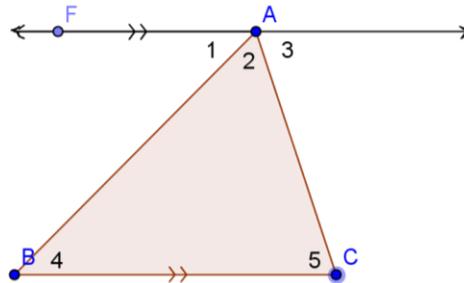
Part B: Color in the basic square pattern below. Use your square to synthesize your own quilt. Describe the transformations you use.



Triangle Relationships

Task 1

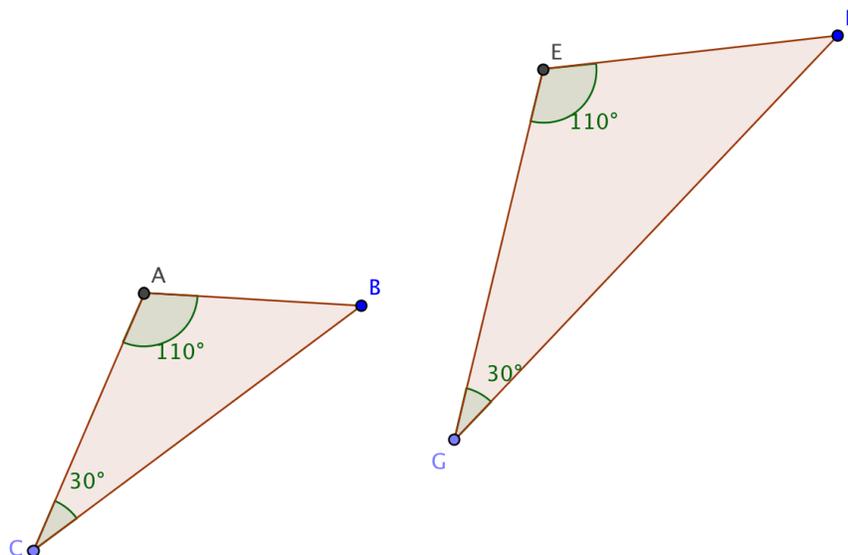
In class, we conducted investigations to show you that the Triangle Angle Sum Theorem holds true. Suppose you were to share what you learned about the sum of the angles in a triangle with your family and they ask you whether or not this applies to all triangles. How would you convince them that this is true for every triangle? Write a paragraph proof that explains why the Triangle Angle Sum Theorem is always true. Support each of your claims with valid reasons, using complete sentences. You may also use the sketch below, patty paper, a flowchart, or proof blocks to help develop your reasoning and thought flow.



Task 2

Look at the two triangles shown below.

- 1 Make a conjecture about $\angle B$ and $\angle F$.
- 2 Can you prove your conjecture?
- 3 If you changed one of the congruent angle pairs to different measure (but keeping them congruent), what would change in your answer to part 1? What would stay the same?
- 4 If you changed the measures of both congruent angle pairs (but keeping the measures in each pair congruent) what would change in your answer to part 1? What would stay the same?
- 5 Make a conjecture about two triangles that have two pairs of congruent angles. What will always be true about the two triangles?



Task 3

Donald wants to build a triangular fence within a plot of land he has purchased for future development. He will build a new fence along the entire driveway, which is 80 feet in length. The previous owners left behind materials for 100 feet of fencing, which Donald will use as a second side. What is the minimum amount of fencing Donald will need to purchase to create the triangular space? If, instead, Donald would like a larger fenced area, what would be the maximum amount of fencing he could use?

Task 4

A crane to the top of a building is lifting an asymmetric load in the form of a heavy, triangular steel girder. The cables wrapped around the girder must intersect in a direct vertical line with the center of gravity. Find the center of gravity for this steel girder.

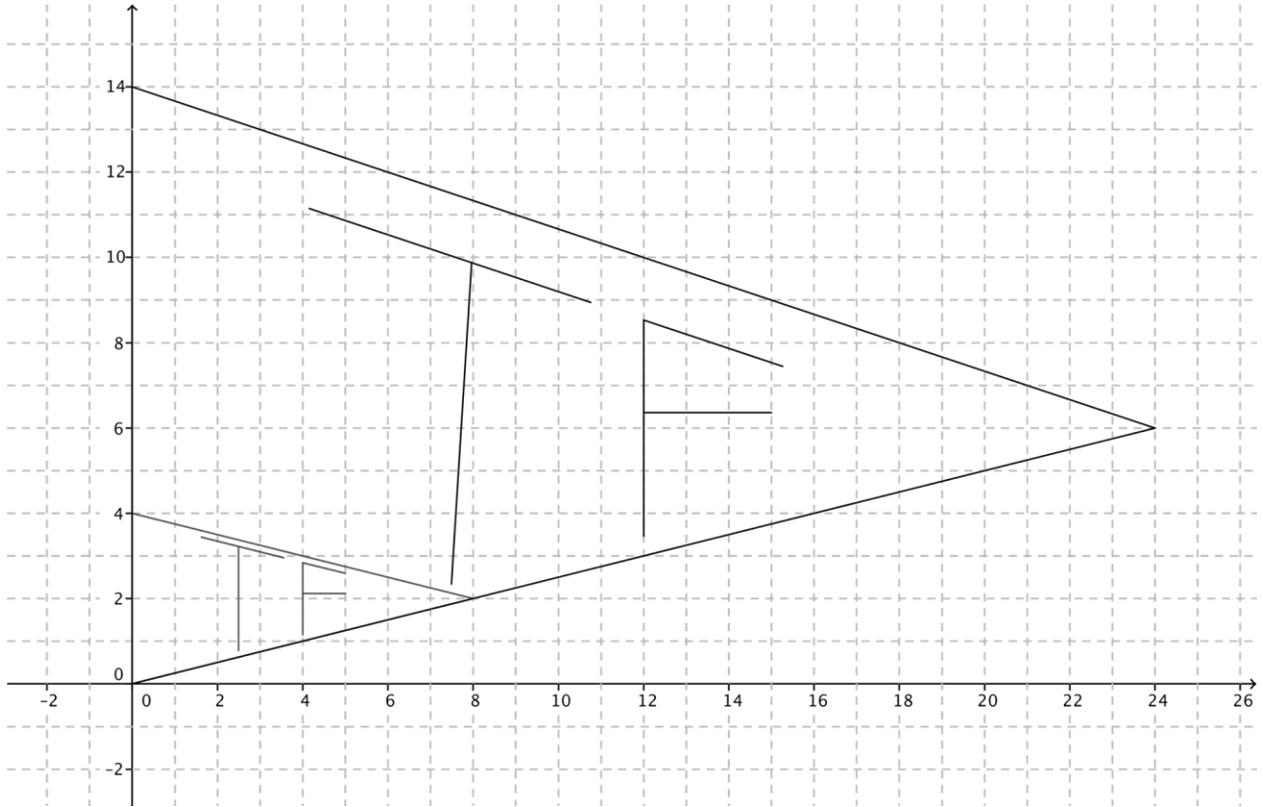


Similarity

Task 1

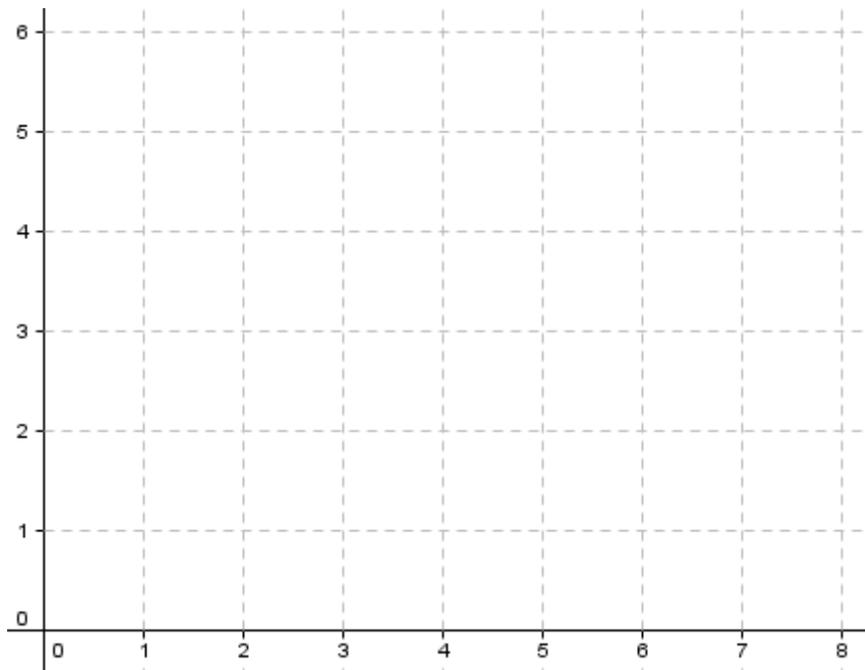
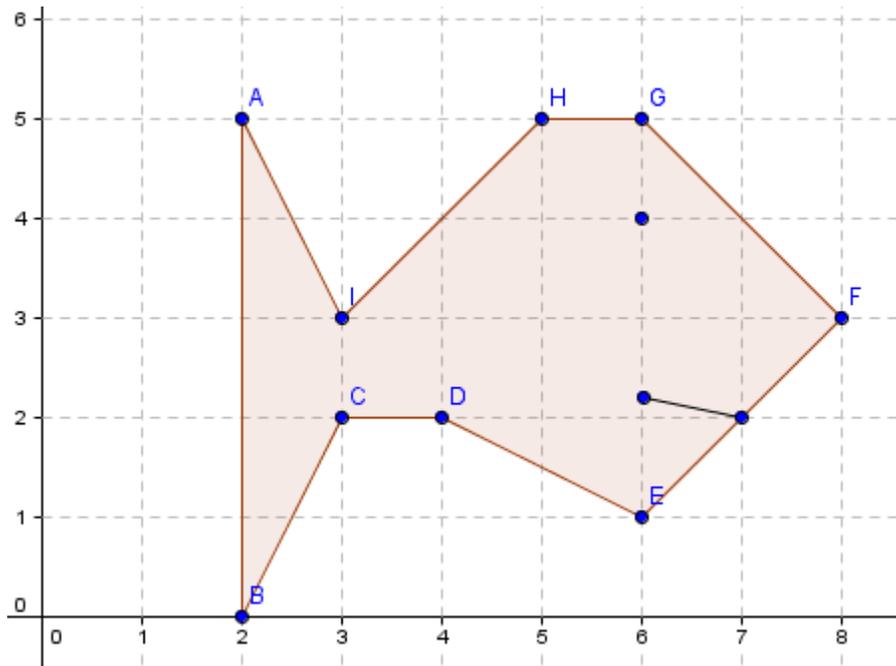
Two track team members are making a simple banner. They were given a small design in one corner and they needed to enlarge it so that it is 3 times larger. They're not quite sure if they enlarged it correctly, though.

Using properties of dilations, determine whether or not the larger image is a dilation of the smaller pre-image. Support your answer using measurements from the graph below.



Task 2

Briana used a computer program to create the logo below for her pet shop. She wants a smaller version of the picture, but she thinks that it is perfectly drawn and does not want to change the look of the picture by distorting its shape. Use the graph below to dilate the logo to make it $\frac{2}{5}$ the size of the fish shown.



Task 3

In the image of the Louvre Pyramid shown below, a small triangle is seen outlined above the entrance. Is that smaller triangle similar to face of the pyramid itself? Justify your answer. You may use rulers, protractors, compasses and graph paper. Assume all lines that appear parallel are parallel. Assume all lengths that appear congruent are congruent.

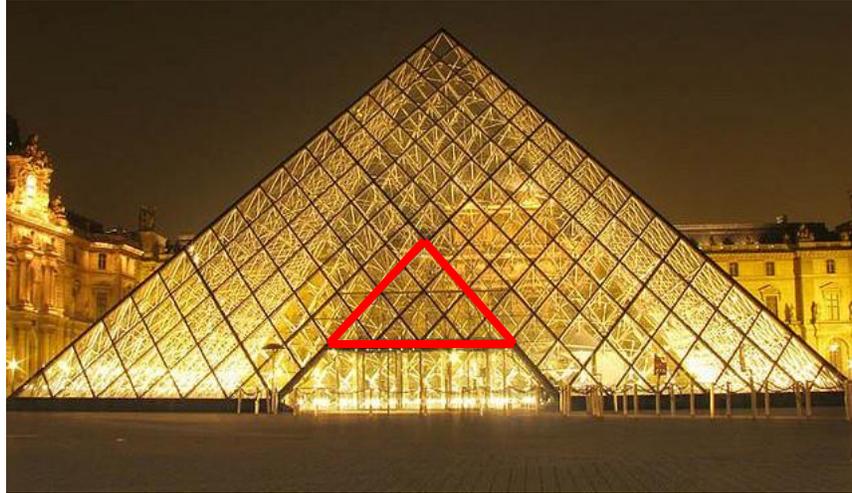


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Non-Discrimination Policy

The School Board of Miami-Dade County, Florida adheres to a policy of nondiscrimination in employment and educational programs/activities and strives affirmatively to provide equal opportunity for all as required by:

Title VI of the Civil Rights Act of 1964 - prohibits discrimination on the basis of race, color, religion, or national origin.

Title VII of the Civil Rights Act of 1964 as amended - prohibits discrimination in employment on the basis of race, color, religion, gender, or national origin.

Title IX of the Education Amendments of 1972 - prohibits discrimination on the basis of gender.

Age Discrimination in Employment Act of 1967 (ADEA) as amended - prohibits discrimination on the basis of age with respect to individuals who are at least 40.

The Equal Pay Act of 1963 as amended - prohibits gender discrimination in payment of wages to women and men performing substantially equal work in the same establishment.

Section 504 of the Rehabilitation Act of 1973 - prohibits discrimination against the disabled.

Americans with Disabilities Act of 1990 (ADA) - prohibits discrimination against individuals with disabilities in employment, public service, public accommodations and telecommunications.

The Family and Medical Leave Act of 1993 (FMLA) - requires covered employers to provide up to 12 weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons.

The Pregnancy Discrimination Act of 1978 - prohibits discrimination in employment on the basis of pregnancy, childbirth, or related medical conditions.

Florida Educational Equity Act (FEEA) - prohibits discrimination on the basis of race, gender, national origin, marital status, or handicap against a student or employee.

Florida Civil Rights Act of 1992 - secures for all individuals within the state freedom from discrimination because of race, color, religion, sex, national origin, age, handicap, or marital status.

Title II of the Genetic Information Nondiscrimination Act of 2008 (GINA) - Prohibits discrimination against employees or applicants because of genetic information.

Veterans are provided re-employment rights in accordance with P.L. 93-508 (Federal Law) and Section 295.07 (Florida Statutes), which stipulate categorical preferences for employment.

In Addition:

School Board Policies 1362, 3362, 4362, and 5517 - Prohibit harassment and/or discrimination against students, employees, or applicants on the basis of sex, race, color, ethnic or national origin, religion, marital status, disability, genetic information, age, political beliefs, sexual orientation, gender, gender identification, social and family background, linguistic preference, pregnancy, and any other legally prohibited basis. Retaliation for engaging in a protected activity is also prohibited.