

Module 1: Transforming Geometric Objects

TOPIC 3: LINE AND ANGLE RELATIONSHIPS

In this topic, students use their knowledge of transformations, congruence, and similarity to establish the Triangle Sum Theorem, the Exterior Angle Theorem, the relationships formed between angles when parallel lines are cut by a transversal, and the Angle-Angle Similarity Theorem for similarity of triangles. Students determine and informally prove the relationships between the special angle pairs formed when parallel lines are cut by a transversal and use these relationships to solve mathematical problems, including writing and solving equations.

Where have we been?

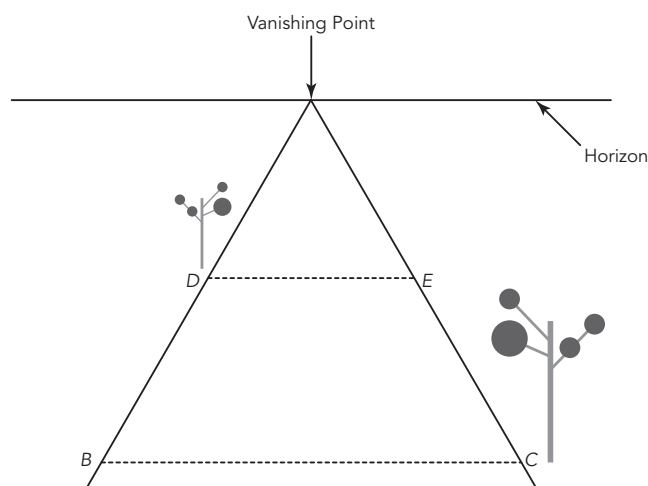
Students use knowledge from grade 7 about supplementary angles and rigid motion transformations when proving theorems in this topic and when exploring the angle relationships formed when parallel lines are cut by a transversal.

Where are we going?

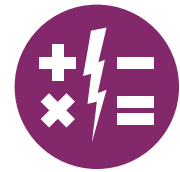
Throughout this topic, students are expected to follow lines of logic to reach conclusions, which is a foundation for formal proof in high school. The geometric results established in this topic via informal arguments will be formally proven in high school, but students' experiences in this topic provide them with opportunities to build intuition and justify results.

Using Triangle Similarity to Create Art

Graphic artists can use similarity to create perspective drawings. This is accomplished using a vanishing point, a point at the horizon where all parallel lines intersect. The two triangles shown in this image, which share a common vertex at the vanishing point, are similar triangles.



Myth: Asking questions means you don't understand.



It is universally true that, for any given body of knowledge, there are levels to understanding. For example, you might understand the rules of baseball and follow a game without trouble. But there is probably more to the game that you can learn. For example, do you know the 23 ways to get on first base, including the one where the batter strikes out?

Questions don't always indicate a lack of understanding. Instead, they might allow you to learn even more on a subject that you already understand. Asking questions may also give you an opportunity to ensure that you understand a topic correctly. Finally, questions are extremely important to ask yourself. For example, everyone should be in the habit of asking themselves, "Does that make sense? How would I explain it to a friend?"

#mathmythbusted

Talking Points

You can further support your student's learning by asking questions about the work they do in class or at home. Your student is learning to think about similar triangles as well as different line and angle theorems from geometry.

Questions to Ask

- How does this problem look like something you did in class?
- Can you show me the strategy you used to solve this problem? Do you know another way to solve it?
- Does your answer make sense? How do you know?
- Is there anything you don't understand? How can you use today's lesson to help?

Key Terms

Triangle Sum Theorem

The Triangle Sum Theorem states that the sum of the measures of the interior angles of a triangle is 180° .

Exterior Angle Theorem

The Exterior Angle Theorem states that the measure of the exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles of the triangle.

transversal

A transversal is a line that intersects two or more lines at distinct points.

Angle-Angle Similarity Theorem

The Angle-Angle (AA) Similarity Theorem states that if two angles of one triangle are congruent to the corresponding angles of another triangle, then the triangles are similar.