

Finding Missing Lengths of Similar Triangles

Summary

Identify triangles as similar or not and use proportions to finding missing lengths of similar triangles.

Materials

Overhead of figures for the Similarity Basketball Game
Trash can or box for basketball goal, and a foam ball
Masking tape for shooting line.

- [Sketching Similar Triangles Rally Coach worksheet](#)
 - [Similar Triangles-Finding Missing Measures](#)
- rulers
- [Solving Height Problems Using Similar Triangles](#)

Background for Teachers

Enduring Understanding (Big Ideas):

If two figures are similar, corresponding angles are congruent and corresponding sides are in proportion.

Essential Questions:

How can a proportion be used to find missing lengths of sides in similar triangles?

How can similar triangles be used to find inaccessible lengths?

Skill Focus:

Find missing sides of similar triangles using a proportion

Vocabulary Focus:

Similar triangle, corresponding angles, corresponding sides

Ways to Gain/Maintain Attention (Primacy):

sketching, games, hands-on, discussion

Instructional Procedures

Starter:

Are the two rectangles similar? Explain.

Are the two triangles similar? Explain.

Lesson Segment 1: Identifying similar figures Using A Proportion

Since the corresponding sides of similar figures form equivalent ratios, a proportion equation can be used to check whether or not two figures are similar. Explain and model for students how a proportion can be used to check for equivalency by identifying a two pairs of corresponding sides, setting up the ratios, and using cross products to check for proportionality.

Game: Similarity Basketball

Set up the trash can or a box for a basket. Place three different pieces of tape on different places on the floor all about 8 feet from the basket. Use a foam ball or wadded up paper ball. Divide the class into two teams: A and B. On the overhead, show one of the pairs of figures below. Ask students to use their knowledge about similar figures and a proportion to help them determine whether the figures are similar or not. On their paper, they should sketch and label each pair, and then determine similarity. After giving them time to put their ideas on their paper, have them check with a buddy to confirm their reasoning. Then, call on one student from a Team A to answer and explain. If the student is correct, they come to shoot a basket, or ask a team mate to shoot for them. The shooter

may choose any tape mark they want to shoot from. The basket is worth 2 points. If the student is not correct, the other team gets to shoot a foul shot for 1 point. Clarify and correct all errors and have the students make corrections on their papers. Teams take turns answering and shooting.

Figures for Basketball Game:

Lesson Segment 2: How can a proportion be used to find missing lengths of sides in similar triangle. Give each pair of students one Sketching Similar Triangles Rally Coach worksheet to look at. Q. How might proportions be used to help you determine how long to make the corresponding side of the missing triangle on this page? Discuss and model a number 1 and 2 helping students count, set up proportions, solve, and sketch

Rally Coach: Divide students into pairs to complete # 3-6 on the *Sketching Similar Triangles Rally Coach* worksheet. One partner takes the role of coach explaining to the other what needs to be done and why. The other partner takes the role of player. The player decides whether or not to follow the coach's advice and works the problem on the paper they share. For the next problem, the roles are reversed. The students take turns being coach and player as they complete the worksheet. Both names must be on the paper. You may need to have one group of three where they all take turns.

Four Corners: When we can't count, we can use the given measures of sides of similar triangles to help us find missing measures. Model using these.

Give each student the *Similar Triangles-Finding Missing Measures* worksheet. Have each student from a team go to a different corner of the room depending on their number (1-4) to meet with other students having that same number. In the corner, they work with others to solve one of the problems. Persons # 1 does problem # 1. Person # 2 does problem # 2. Person # 3 does problem # 3. Person # 4 does problem # 4. Give them enough time to make sure every person in a corner can explain how to set up and solve the problem using a proportion. Students go back to their home teams where they take turns teaching their team members the problem they did in the corner.

Lesson Segment 3: How can similar triangles be used to find inaccessible lengths?

Have student pairs form similar triangles using a mirror to find inaccessible heights. Set mirror on the floor in front of a student. The student back away from mirror until the inaccessible object becomes visible. Partner measures the student's height, the distance the student is from the mirror and the distance the mirror is from the object. They set up proportion to find the height of the object. Then repeat using the partners height. See *Solving Height Problems Using Similar Triangles* worksheet. Assign text practice as needed.

Assessment Plan

observation, questions, performance task

Bibliography

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