

Lesson Title: How Tall is the Flagpole?		Geo 7.2
Utah State Core Standard and Indicators: Geometry Standards 3.1 Process Standards 1-5		
Summary		
In this lesson, students experience proportional relationships using similar figures. They apply three methods using similar triangles to find the height of a flagpole.		
Enduring Understanding	Essential Questions	
Because similar figures are proportional, we can use proportion equations to find missing measurements.	How can we use the equivalent relationships found in similar figures to help us solve problems?	
Skill Focus	Vocabulary Focus	
Using similar figures and proportion to find missing measurements.		
Materials: Calculators, Computers with Geometer's Sketchpad, worksheets, measuring tools, mirrors		
Launch ideas:		
"Talk about shadows and finding the height of buildings, friends, goal posts, etc. Previous lesson- teach similarity and proportions."		
Explore ideas:		
"Student: Do worksheet- show all proportion work. Teacher: Help with discovery of section IV and V."		
"We enjoyed this activity and so did the students. Students liked the backside where they had to make congruent shapes inside the shapes and the really liked the flag activity. On section II, we would add angle measures and markings. Over all we gave this activity a "two thumbs up" because it was a great ending to our similarity unit."		
Summarize ideas:		
"Have students do flag activity on their own and then discuss as a class what people discovered."		
"We also thought that a good "referring back to" could happen as a lead in to the trig section at the end of the year."		
Apply		
Assessment ideas:		
All or part of the activity below can be used as a follow-up or as an assessment. You will need a sunny day to go outside and use shadows for indirect measurement. You will also need to communicate the process well before going outside. If you use meter sticks, groups will need at least 2 each		

Information:

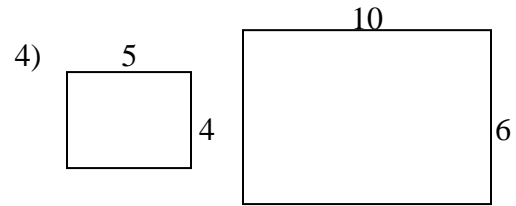
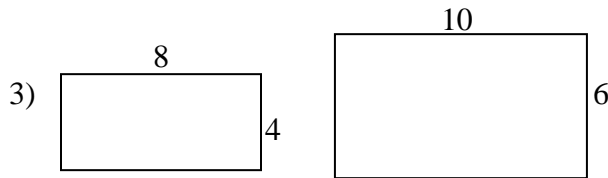
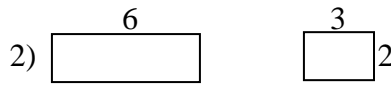
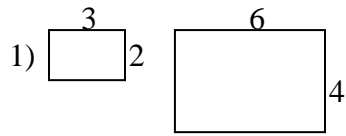
If desired, access and use the following activities from Exploring Geometry with Geometer's Sketchpad:

- Finding the Width of a River, Pages 174-175
- Finding the Height of a Tree, Pages 176-177
- Measuring Height with a Mirror, Pages 179-180

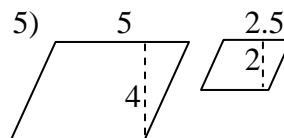
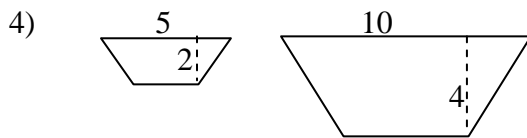
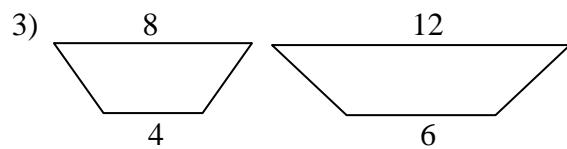
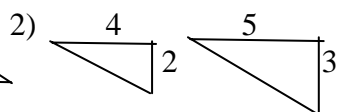
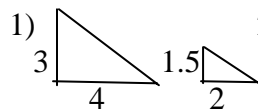
Geo 7.2

How Tall is the Flagpole?

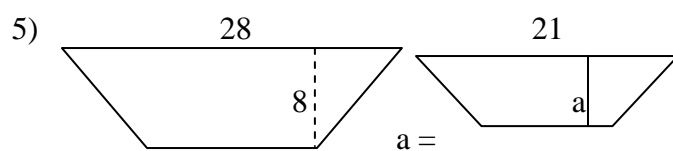
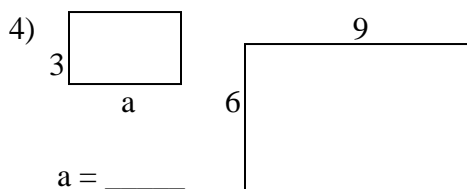
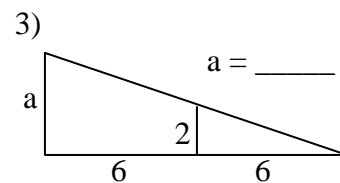
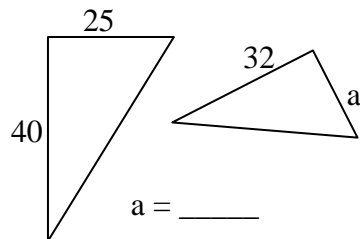
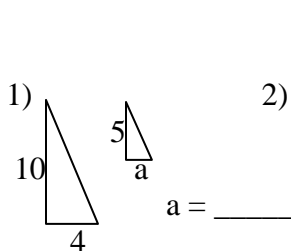
I. When figures are stretched proportionally, that is they grow by the same scale factor in every dimension, they are said to be similar. Without measuring, which pairs of rectangles below are similar? _____



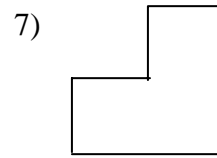
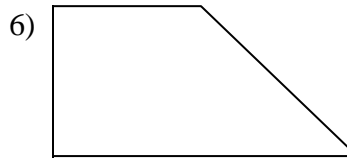
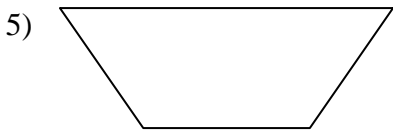
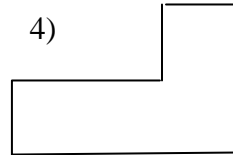
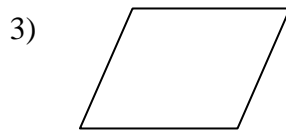
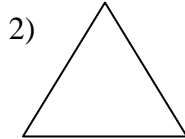
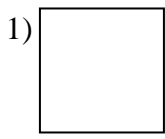
II. Which figure pairs below are similar? _____



III Find the missing measurements



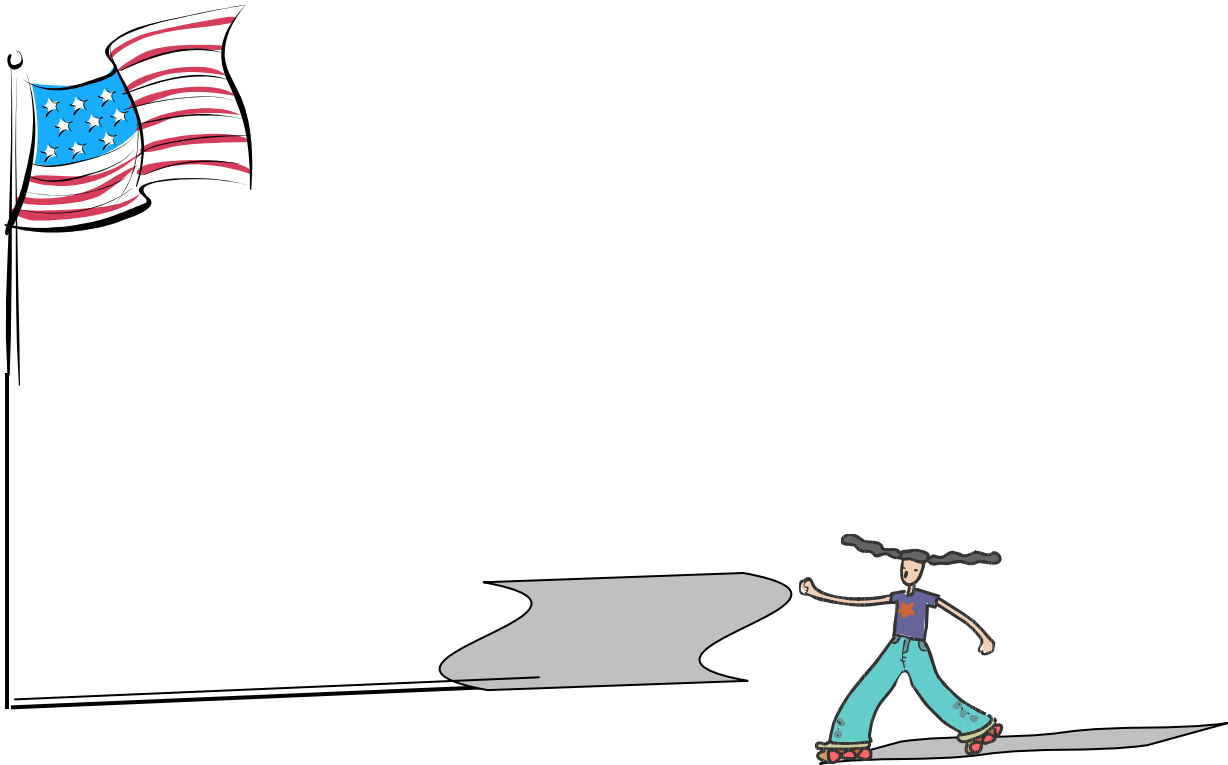
IV Subdivide these figures into 4 congruent shapes which are similar to the original shape. Inside each shape, draw 4 congruent shapes which are similar to the outside shape.



V. How Tall is the Flagpole? Use your knowledge of similarity and proportion to discover the height of the flagpole below.

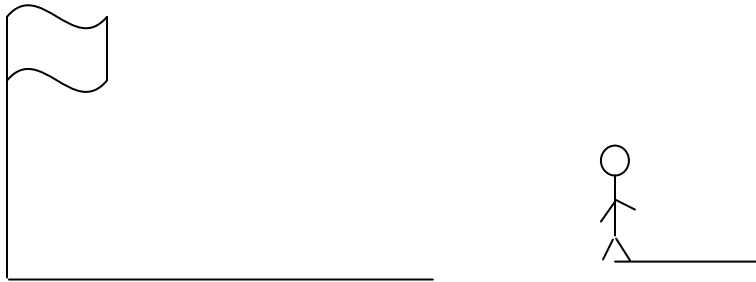
The skater below is 1.6 meters tall. Her shadow is 2.1 meters long. The flagpole shadow is 3.9 meters long. How tall is the flagpole?

Explain or draw to show how you can use similarity to figure out how tall the flagpole is.

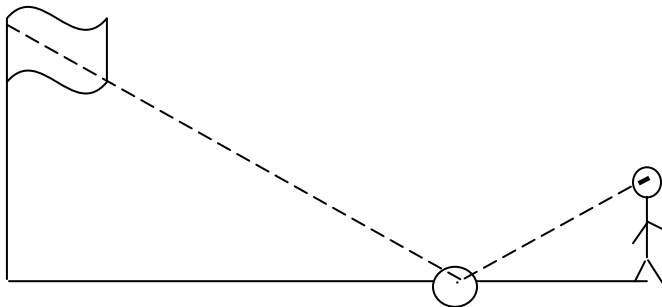


Find the height of the flagpole in your school yard or the school building. *Label measurements and show all work below.*

Method 1: The Shadow Knows

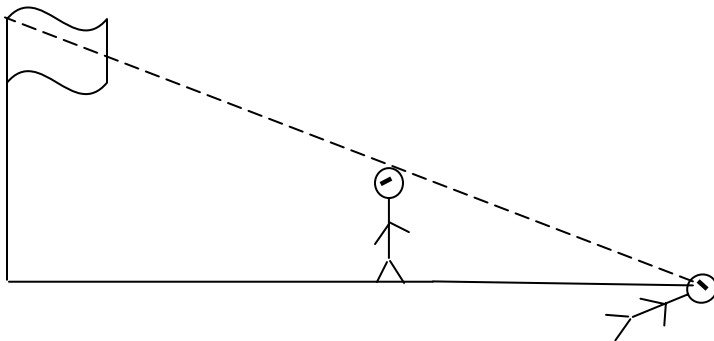


Method 2: Mirror Secrets



Explain why this method works.

Method 3: Vision Line



(This guy is laying down and telling guy 2 to move until the top of his head is in line with the top of the flagpole.)