

Questions on 6.3 HW?

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### Ready

Topic: Solving proportions

Solve each proportion. Show your work and check your solution.

1.  $\frac{3}{4} = \frac{x}{20}$

2.  $\frac{x}{7} = \frac{18}{21}$

3.  $\frac{3}{6} = \frac{8}{x}$

4.  $\frac{9}{c} = \frac{6}{10}$

5.  $\frac{3}{4} = \frac{b+3}{20}$

6.  $\frac{7}{12} = \frac{a}{24}$

7.  $\frac{a}{2} = \frac{13}{20}$

8.  $\frac{3}{b+2} = \frac{6}{5}$

Handwritten work for problem 2:

$$\frac{x}{7} = \frac{18}{21}$$

$$21x = 7 \cdot 18$$

$$21x = 126$$

$$\frac{21x}{21} = \frac{126}{21}$$

$$x = 6$$

Handwritten work for problem 5:

$$\frac{3}{4} = \frac{b+3}{20}$$

$$4(b+3) = 3 \cdot 20$$

$$4b + 12 = 60$$

$$-12 \quad -12$$

$$\frac{4b}{4} = \frac{48}{4}$$

$$b = 12$$

Handwritten work for problem 8:

$$\frac{3}{b+2} = \frac{6}{5}$$

$$3 \cdot 5 = 6(b+2)$$

$$15 = 6b + 12$$

$$-12 \quad -12$$

$$\frac{3}{4} = \frac{6b}{4}$$

$$0.5 = \frac{1}{2} = b$$

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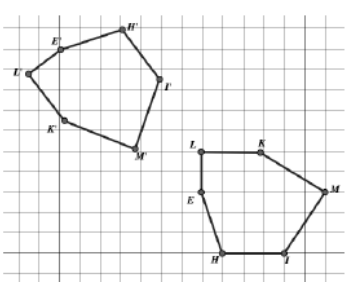
12. The polygons on the grid below are similar.      13. The polygons on the grid below are similar.

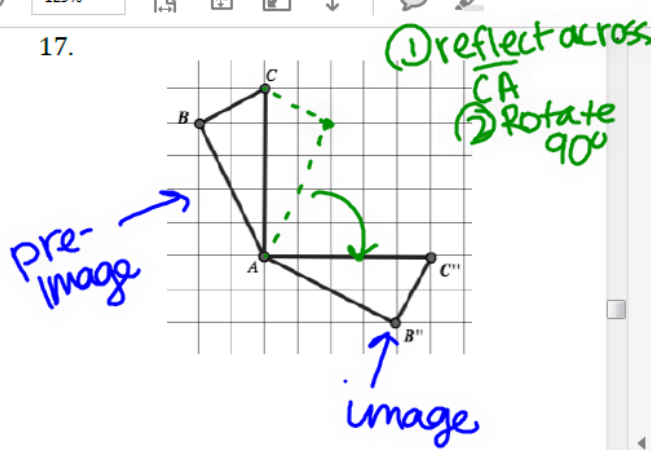
*center of dilation since it exists, these are similar.*

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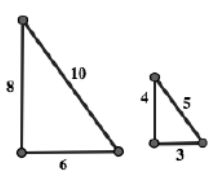
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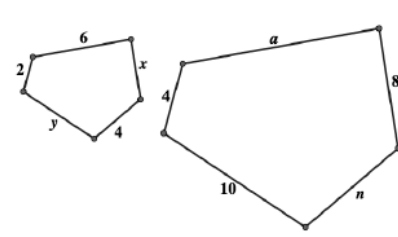
16. 

17. 

**Go**  
 Topic: Ratios in dilated polygons

**For each pair of similar polygons give three ratios that would be equivalent.**

18. 

19. 

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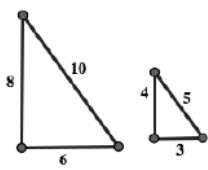
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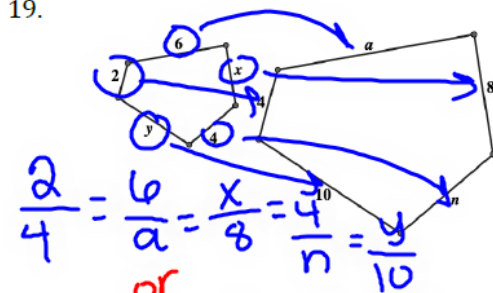
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For each pair of similar polygons give three ratios that would be equivalent.

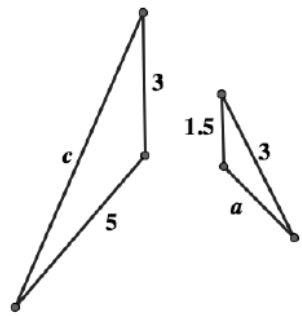
18.



19.

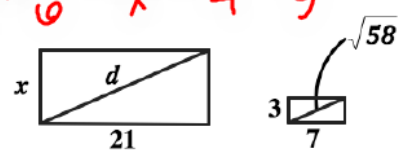


20.



21.

or

$$\frac{4}{a} = \frac{a}{6} = \frac{8}{x} = \frac{n}{4} = \frac{10}{y}$$


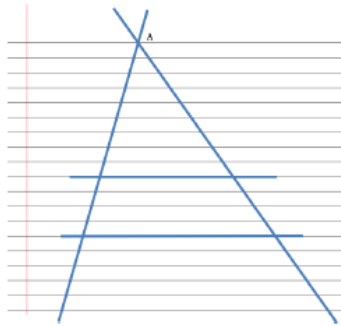
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# 6.4 Cut By a Transversal

## A Solidify Understanding Task

Draw two intersecting transversals on a sheet of lined paper, as in the following diagram. Label the point of intersection of the transversals A. Select any two of the horizontal lines to form the third side of two different triangles.



1. What convinces you that the two triangles formed by the transversals and the horizontal lines are similar?

2. Label the vertices of the triangles. Write some proportionality statements about the sides of the triangles and then verify the proportionality statements by measuring the sides of the triangles.

①  $\triangle ABC \sim \triangle ADE$  ?  
They are similar because  $\angle ABC \cong \angle ADE$  and  $\angle ACB \cong \angle AED$ , which gives us AA ~

②  $\frac{AB}{AD} = \frac{AC}{AE}$   
To verify the proportion check cross-products  
 $\downarrow \frac{5.7}{8.3} = \frac{6.2}{9.2}$   
 $0.6867 \quad 0.6739$   
pretty close to = (for human error)  
check the ratios (for=)

$\frac{BC}{DE} = \frac{AB}{AD} \quad \frac{BC}{DE} = \frac{AC}{AE}$

3. Select a third horizontal line segment to form a third triangle that is similar to the other two. Write some additional proportionality statements and verify them with measurements.

③  $\frac{AF}{AB} = \frac{AG}{AC}$   
 $\frac{AF}{AD} = \frac{AG}{AE}$   
 $\frac{FG}{BC} = \frac{AG}{AC}$   
 $\frac{FG}{DE} = \frac{AG}{AE}$   
+more...

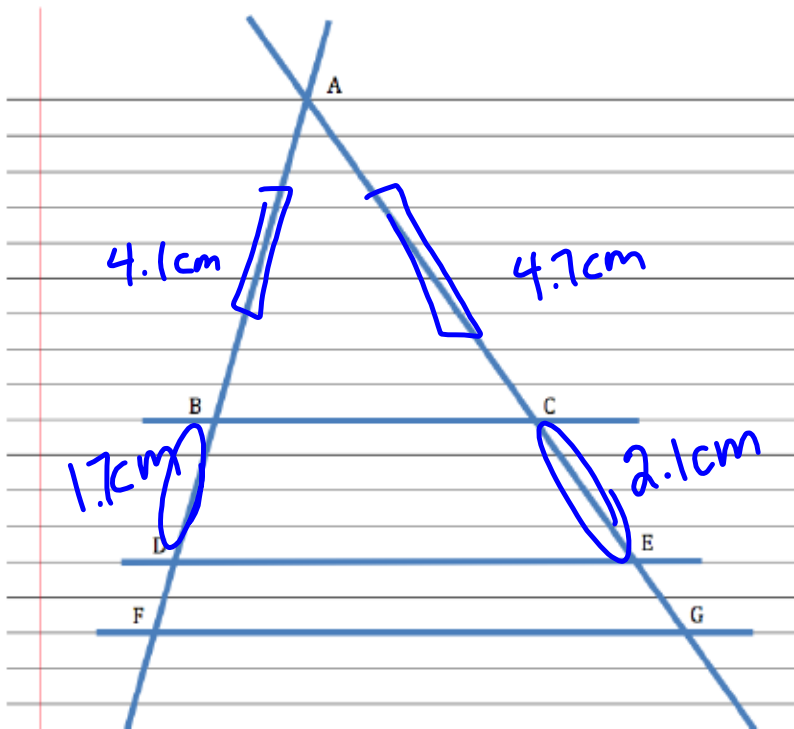
①  $\triangle ABC$   
They are similar because  $\angle ACB \cong \angle AED$  gives us

②  $\frac{AB}{AD} = \frac{AC}{AE}$   
 $\downarrow \frac{5.7}{8.3} = \frac{6.2}{9.2}$   
 $0.6867 \quad 0.6739$   
pretty close to =

$\frac{BC}{DE} = \frac{AB}{AD}$

Tristan has written this proportion for question 3, based on his diagram:  $\frac{BD}{AB} = \frac{CE}{AC}$

Tia thinks Tristan's proportion is wrong, because some of the segments in his proportion are not sides of a triangle.



4. Check out Tristan's idea using measurements of the segments in his diagram at the left.

$$\frac{1.7}{4.1} = \frac{2.1}{4.7}$$

↓                      ↓

$$0.4146 \rightarrow 0.4468$$

close enough

5. Now check out this same idea using proportions of segments from your own diagram. Test at least two different proportions, including segments that do not have A as one of their endpoints.

$$\frac{BD}{DF} = \frac{CE}{EG}$$

6. Based on your examples, do you think Tristan or Tia is correct?

Tia still isn't convinced, since Tristan is basing his work on a single diagram. She decides to start with a proportion she knows is true:  $\frac{AD}{AB} = \frac{AE}{AC}$ . (Why is this true?) *Similar Δs*

Tia realizes that she can rewrite this proportion as  $\frac{AB + BD}{AB} = \frac{AC + CE}{AC}$  (Why is this true?)

Can you use Tia's proportion to prove algebraically that Tristan is correct?

$$\frac{1+3}{4} = \frac{1}{4} + \frac{3}{4}$$

$$\frac{AB}{AB} + \frac{BD}{AB} = \frac{AC}{AC} + \frac{CE}{AC}$$

$$1 + \frac{BD}{AB} = 1 + \frac{CE}{AC}$$

-1                      -1

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$$\frac{BD}{AB} = \frac{CE}{AC}$$

What Tristan said was true!

Homework

Finish 6.4 "Ready, Set, Go"