Lesson 17: The Side-Angle-Side (SAS) and Side-Side-Side (SSS) Criteria for Two Triangles to be Similar

Classwork

Opening Exercise

* 1. Choose three lengths that represent the sides of a triangle. Draw the triangle with your chosen lengths using construction tools.
	2. Multiply each length in your original triangle by $2$ to get three corresponding lengths of sides for a second triangle. Draw your second triangle using construction tools.
	3. Do your constructed triangles appear to be similar? Explain your answer.
	4. Do you think that the triangles can be shown similar without knowing the angle measures?

Exploratory Challenge 1/Exercises 1–2

1. Examine the figure and answer the questions to determine whether or not the triangles shown are similar.



* 1. What information is given about the triangles in Figure 1?
	2. How can the information provided be used to determine whether $△ABC$ is similar to $ △AB^{'}C^{'}$?
	3. Compare the corresponding side lengths of $△ABC$ and $ △AB^{'}C^{'}$. What do you notice?
	4. Based on your work in parts (a)–(c), draw a conclusion about the relationship between $△ABC$ and $△AB^{'}C^{'}$. Explain your reasoning.
1. Examine the figure, and answer the questions to determine whether or not the triangles shown are similar.



* 1. What information is given about the triangles in Figure 2?
	2. How can the information provided be used to determine whether $△PQR$ is similar to $△PQ'R'$?
	3. Compare the corresponding side lengths of $△PQR$ and $ △PQ'R'$. What do you notice?
	4. Based on your work in parts (a)­–(c), draw a conclusion about the relationship between $△PQR$ and $△PQ'R'$. Explain your reasoning.

Exploratory Challenge 2/Exercises 3–4

1. Examine the figure and answer the questions to determine whether or not the triangles shown are similar.



* 1. What information is given about the triangles in Figure 3?
	2. How can the information provided be used to determine whether $△ABC$is similar to $△AB^{'}C^{'}$?
	3. Compare the corresponding side lengths of $△ABC$ and $ △AB^{'}C^{'}$. What do you notice?
	4. Based on your work in parts (a)–(c), make a conjecture about the relationship between $△ABC$ and$ △AB^{'}C^{'}$. Explain your reasoning.
1. Examine the figure and answer the questions to determine whether or not the triangles shown are similar.



* 1. What information is given about the triangles in Figure 4?
	2. How can the information provided be used to determine whether $△ABC$is similar to $△AB^{'}C^{'}$?
	3. Compare the corresponding side lengths of $△ABC$ and $△AB^{'}C^{'}$. What do you notice?
	4. Based on your work in parts (a)–(c), make a conjecture about the relationship between $△ABC$ and $△AB^{'}C^{'}$. Explain your reasoning.

Exercises 5–10

1. Are the triangles shown below similar? Explain. If the triangles are similar, write the similarity statement.



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Problem Set

1. For each part (a) through (d) below, state which of the three triangles, if any, are similar and why.
	1. 



* 1.



* 1.



* 1.

1. For each given pair of triangles, determine if the triangles are similar or not, and provide your reasoning. If the triangles are similar, write a similarity statement relating the triangles.
	1. 



* 1.



* 1.



* 1.

1. For each pair of similar triangles below, determine the unknown lengths of the sides labeled with letters.
	1. 



* 1.
1. Given that $\overbar{AD}$ and $\overbar{BC}$ intersect at $E$, and $\overbar{AB}∥\overbar{CD}$, show that $∆ABE\~∆DCE$.

1. Given $BE=11$, $EA=11$, $BD=7$, and $DC=7$, show that $∆BED\~∆BAC$.



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1. Given the diagram below, $X$ is on $\overbar{RS}$ and $Y$ is on $\overbar{RT}$, $XS=2$, $XY=6$, $ST=9$, and $YT=4$.
	1. Show that $∆RXY\~∆RST$.
	2. Find $RX$ and $RY$.
2. One triangle has a $120°$ angle, and a second triangle has a $65°$ angle. Is it possible that the two triangles are similar? Explain why or why not.
3. A right triangle has a leg that is $12 cm$ long, and another right triangle has a leg that is $6 cm$ long. Are the two triangles similar or not? If so, explain why. If not, what other information would be needed to show they are similar?
4. Given the diagram below, $JH=7.5$, $HK=6$, and $KL=9$, is there a pair of similar triangles? If so, write a similarity statement and explain why. If not, explain your reasoning.