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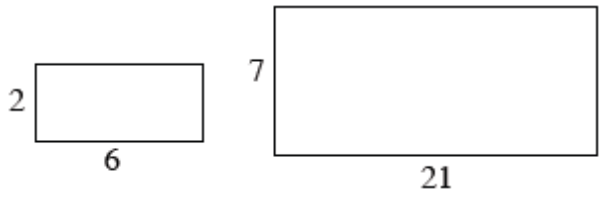
3.1.3 – Using Ratios of Similarity

3-24. Refer to the rectangles below.



a. Show that there is a sequence of one or more transformations that can carry one rectangle onto the other.

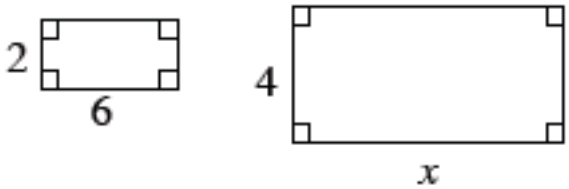
b. Use ratios to show that these rectangles are similar (figures that have the same shape, but not necessarily the same size).

c. What other ratios could you use?

d. Linh claims that these figures are not similar. When she compared the heights, she wrote $\frac{2}{7}$. Then she compared the bases and got $\frac{21}{6}$. Why is Linh having trouble? Explain completely.

3-25. Each pair of figures below is similar. Review what you have learned so far about similarity as you solve for x.

a.



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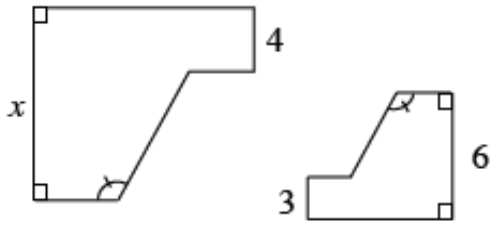
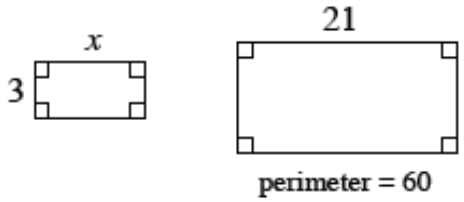
b.



c.

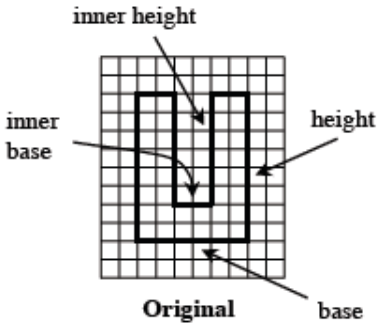


3-26. Casey's back at it! Now she wants you to enlarge the block "U" for her spirit flag.

a. Copy her "U" onto graph paper.

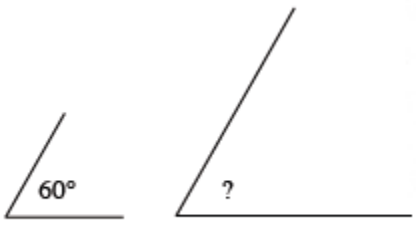
b. Now draw a larger "U" with a zoom factor of $\frac{3}{2} = 1.5$. What is the height of the new "U"?

c. Find the ratio of the perimeters. That is, find $\frac{\text{Perimeter New}}{\text{Perimeter Original}}$. What do you notice?



d. Casey enlarged "U" proportionally so that it has a height of 10. What was her zoom factor? What is the base of this new "U"? Justify your conclusion.

3-27. After enlarging his "U" in problem 3-26, Al has an idea. He drew a 60° angle, as shown in Diagram #1 below. Then, he extended the sides of the angle so that they are twice as long, as shown in Diagram #2. "*Therefore, the new angle must have measure 120°,"* he explained. Do you agree? Discuss this with your team and write a response to Al.



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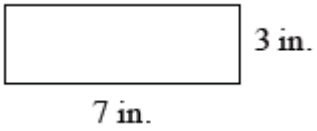
3-28. Al noticed that the ratio of the perimeters of two similar figures is equal to the ratio of the side lengths. *"What about the area? Does it grow the same way?"* he wondered.



a. Find the area and perimeter of the rectangle above.

b. Test Al's question by enlarging the rectangle by a zoom factor of 2. Then find the new area and perimeter.

c. Answer Al's question: Does the perimeter double? Does the area double? Explain what happened.