



Scale Factor, Area, and Perimeter

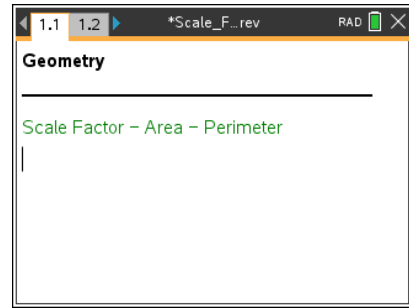
Student Activity

Name _____
Class _____

Open or create the TI-Nspire document

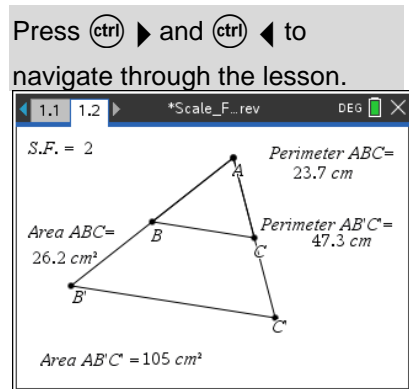
Scale_Factor_Area_Perimeter.tns.

The relationship of the scale factor and area and perimeter of similar triangles will be explored by dragging a vertex of a triangle. Additional observations will be made after changing the scale factor.



Move to page 1.2.

$\triangle AB'C'$ was constructed by dilating $\triangle ABC$ through point A with the given scale factor of 2. Therefore, $\triangle ABC \sim \triangle AB'C'$.



1. Move point A. Describe the changes that occur as you move the point.
2. Suppose that point A is moved such that the measure of \overline{AB} is 5, \overline{BC} is 7, and \overline{AC} is 4. What would the measures be for each of the corresponding segments on $\triangle AB'C'$? Justify your answer.

$AB' = \underline{\hspace{2cm}}, B'C' = \underline{\hspace{2cm}}, AC' = \underline{\hspace{2cm}}$

3. Complete the table below by moving point A to three locations.

| Scale Factor 2 | Similar Δ 's Pair 1 | Similar Δ 's Pair 2 | Similar Δ 's Pair 3 |
|-----------------------------|----------------------------|----------------------------|----------------------------|
| Perimeter $\triangle ABC$ | | | |
| Perimeter $\triangle AB'C'$ | | | |
| Area $\triangle ABC$ | | | |
| Area $\triangle AB'C'$ | | | |

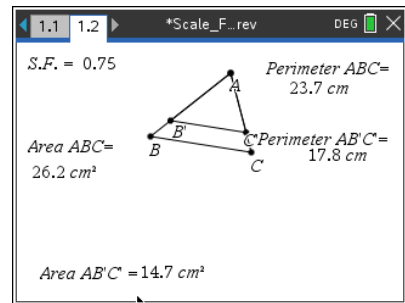
4. Use the measurements recorded in the table above to make relative comparisons of the perimeters of $\triangle ABC$ and $\triangle AB'C'$.



5. Use the measurements recorded in the table to make relative comparisons of the areas of $\triangle ABC$ and $\triangle AB'C'$.

6. Predict what will happen to the relative comparisons of the perimeters and areas if the scale factor is changed.

7. To complete the table below, do the following:
 - a. Change the scale factor to 3 and move point A to three different locations.
 - b. Change the scale factor to $\frac{3}{4}$ and move point A to three different locations.



To change the scale factor, move the cursor over the current scale factor of 2 located in the upper-left corner of the screen. Double-click. The cursor is now inside the text box. Press $\text{\textcircled{del}}$ and type the new scale factor. Then press $\text{\textcircled{enter}}$.

| Scale Factor 3 | Similar Δ 's Pair 1 | Similar Δ 's Pair 2 | Similar Δ 's Pair 3 |
|-----------------------------|----------------------------|----------------------------|----------------------------|
| Perimeter $\triangle ABC$ | | | |
| Perimeter $\triangle AB'C'$ | | | |
| Area $\triangle ABC$ | | | |
| Area $\triangle AB'C'$ | | | |

| Scale Factor $\frac{3}{4}$ | Similar Δ 's Pair 1 | Similar Δ 's Pair 2 | Similar Δ 's Pair 3 |
|--|----------------------------|----------------------------|----------------------------|
| Perimeter $\triangle ABC$ | | | |
| Perimeter $\triangle AB'C'$ | | | |
| Area $\triangle ABC$ | | | |
| Area $\triangle AB'C'$ | | | |



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8. Using the perimeter and area measurements recorded for $\triangle ABC$ above for Similar Δ 's Pair 1, give the following measurements for $\triangle AB'C'$ if the scale factor is 5.

Perimeter $\triangle AB'C'$ = _____; Area $\triangle AB'C'$ = _____.

9. Make a conjecture about the relative comparison of the perimeters of the similar triangles if the scale factor is r .

10. Make a conjecture about the relative comparison of the areas of the similar triangles if the scale factor is r .