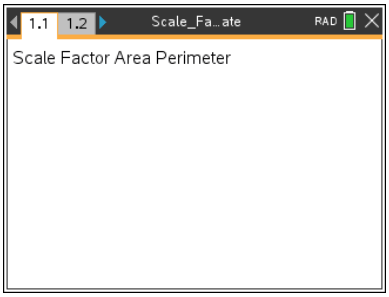
Creating: Scale Factor, Area, and Perimeter
MATH NSPIRED

Activity Overview:

Similar triangles will be created using dilation to investigate the relationship between scale factor and area and perimeter.



Materials

- *Technology needed (TI-Nspire™ handheld, computer software)*

Steps

Step 1: Preparing the document

1. Open a new document by clicking [on] > **New Document > Add Notes**.
2. Type: Scale Factor Area Perimeter.

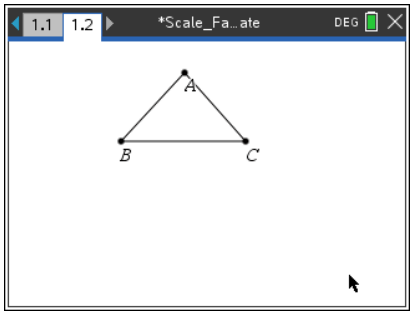
Note: To obtain capital letters, press the [shift] key, then the letter.

3. Press [doc] **> File > Save As ….**
   Type: Scale_Factor_Area_Perimeter.
   Tab to [save] and press [enter].

Note: To obtain the underscore, press [ctrl] [␣].

4. Add a new page by pressing [ctrl] [doc] **> Add Geometry**.
5. To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.

Step 2: Drawing triangle *ABC* and labeling its vertices

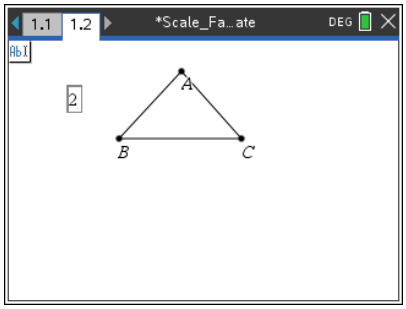


1. Press **Menu >Shapes > Triangle.**

Note: Draw a small triangle because you will make it twice as large.

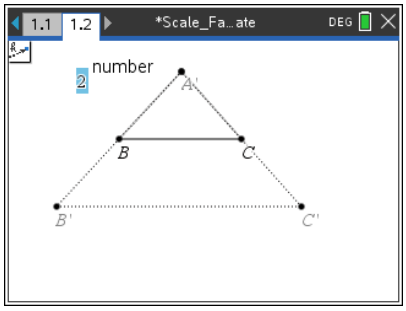
2. Move the cursor to a position near the top of the screen to place the first vertex. Press [enter]. Immediately press [shift] [A].
3. Move the cursor to a new location for the second vertex and press [enter]. Immediately press [shift] [B].
4. Move the cursor to a new location for the second vertex and press [enter]. Immediately press [shift] [C].
5. Press [esc] to exit the **Triangle** tool.

Step 3: Defining the scale factor as 2 for the dilation



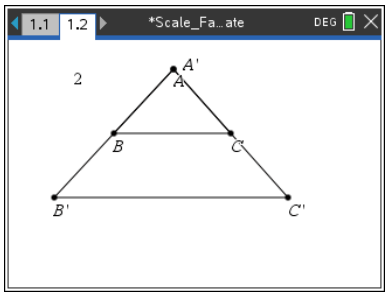
1. Press **Menu > Actions > Text**.
2. Move the cursor to where you would like to put the text. Press enter.
3. Type the number 2. Press enter.
4. Press esc to exit the **Text** tool.

Step 4 Dilating the triangle



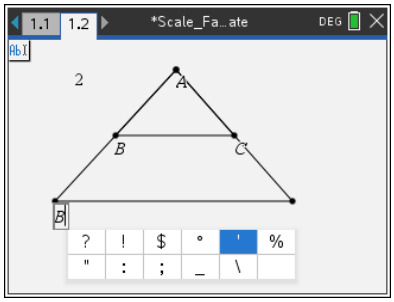
1. Press **Menu > Transformation > Dilation**.
2. Move the cursor to vertex *A* of the triangle (center of dilation). When the words *point A* appear, press enter or .
3. Move the cursor to the number 2 (scale factor). When the word *number* appears, press enter or .
4. Move the cursor to the triangle. When the words *triangle ABC* appear, press enter or .
5. Press esc to exit the **Dilation** tool.

Note: If you cannot see the entire figure, drag the vertices or sides of the original triangle until you can. Point *A*, the point selected as the point of dilation, cannot be dragged, but the other two vertices of the triangle and the triangle itself can be.



If Needed

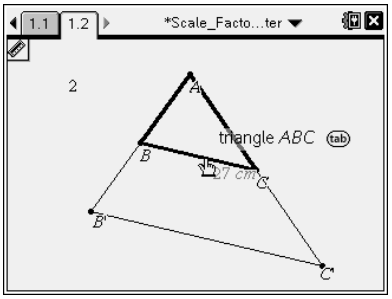
Step 5: Labeling the new points – if not automatically labeled.

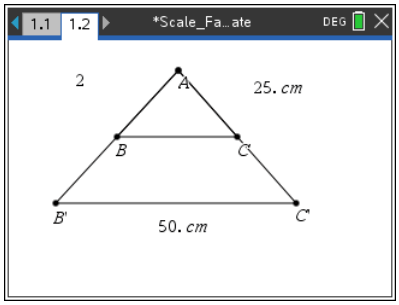


1. Press **Menu > Actions > Text**.
2. Move to the point on the new triangle that is the image of point *B*. The word *point* will appear. Press enter. Type shift B ?! ' (apostrophe, see figure at right) and press enter.
3. Move the cursor to the image of point *C*. The word *point* will appear. Press enter shift C ?! ' and press enter.
4. Press esc to exit the **Text** tool.

Step 6: Measuring and displaying the perimeter of the triangles

1. Press **Menu > Measurement > Length**.
2. Move the cursor over $\overline{BC}$ of Δ*ABC* until the outline of Δ*ABC* is bold and press enter.
3. Move the displayed measurement near the bottom of the screen and press enter to release it. (This is the perimeter of Δ*ABC*.)
4. Move the cursor over $\overline{B'C'}$ of Δ*AB'C'* until its outline is bold and press enter.
5. Move the measurement beside the previous measurement. Press enter. (This is the perimeter of Δ*AB'C'*.)
6. Press esc to exit the **Measurement** tool.





Step 7: Measuring and displaying the area of the triangles

1. Press **Menu > Measurement > Area**.
2. Move the cursor over $\overline{BC}$ of Δ*ABC* until the outline of Δ*ABC* is bold and press enter.
3. Move the measurement below the perimeter measurement for Δ*ABC* and press enter.
4. Repeat for Δ*AB'C'*.
5. Press esc to exit the **Measurement** tool.