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1. Use only a ruler and pencil. Try to scale figures like these by the factor 2.

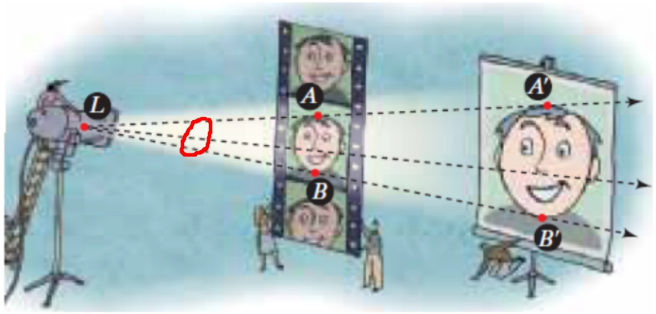
a. 

b. 

c. 

4.7 Making Scaled Copies

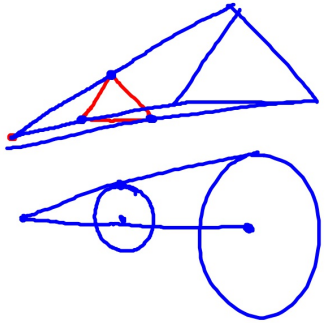
Objective: Students will describe and use methods for constructing enlargements or reductions of shapes



Dilation: A transformation in which a polygon is enlarged or reduced by a given factor around a given center point called the center of dilation.

How many points would you have to dilate to make a good sketch of each of the following?

- A triangle 3 pts (3 vertices)
- A square 4 pts (4 vertices)
- A circle with a given center 2 pts (center & outside)
- A circle with its center not given 4 pts (top, bottom, right & left)



Check Your Understanding

2. a. Draw a tilted square on a piece of paper. Dilate it by the factor 2. Dilate at least eight points before drawing the entire dilation image.
   b. How does the orientation of the dilated square compare with that of the original tilted square?
   c. Is orientation affected by your choice for the center of dilation?

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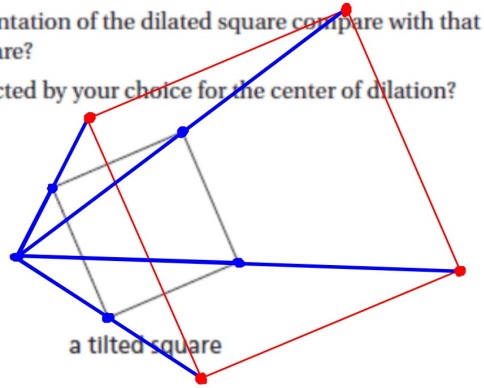
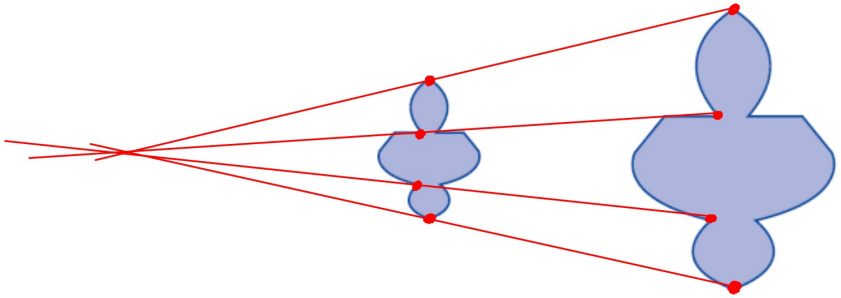


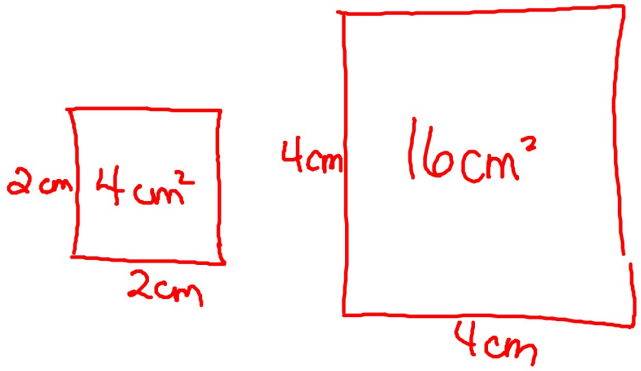
a tilted square

4. The ornamental pattern on the left below was dilated by the factor 2. A dilation copy is on the right. Locate the center of dilation.



10. Standardized Test Prep Suppose you dilate a square by the factor 2. How does the area of the dilated square compare to the area of the original square?

A. It is the same.
B. It is 2 times greater.
C. It is 4 times greater.
D. It is 8 times greater.



On Your Own

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5. Choose a favorite picture. It might be like Trig, the horse shown here. Dilate the picture by the factor 2 to make a scaled sketch. You do not need to scale all the details from your picture. A rough outline is fine, but be sure to include at least the important ones.

In Exercises 6–9, you can investigate a dilation that has surprising results. Stand in front of a mirror (perhaps a bathroom mirror at home). Trace your image with a bar of soap. Include important features like your eyes, nose, mouth, and chin.

6. Use a ruler. Measure a few of the distances on your mirror picture. How far apart are your eyes? How wide is your mouth? How far is it from your chin to the top of your head?

7. Compare the distances you've measured on the mirror to the actual measurements of your face. Are they the same?

8. How can the concept of dilation help explain your results?

9. Stand in front of the mirror again. Have a friend trace the image of your face.