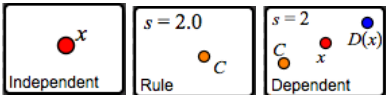


In this activity you will dilate an independent variable and compare its motion to the motion of its dependent variable.

DILATE A POINT

Begin by dilating a point and describing how the variables behave.

1. In your browser open geometricfunctions.org/fc/unit1/dilate-family/.

2. Use the first three tools  to create a dilate function.

3. Drag independent variable x and observe the behavior of $D_{C,s}(x)$.

Q1 Turn on tracing for both variables, drag x , and draw a picture of the result in the space below on the left. Be sure to mark x , C , and $D_{C,s}(x)$ in your picture.

Q2 Change the scale factor s to 0.50, erase the traces, and drag again. Draw a picture of the result below on the right.

$s = 2$	$s = 0.5$
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Q3 As you drag x , how does $D_{C,s}(x)$ behave? Fill in the blanks below.

$s = 0.50$	Drag x left	Drag x up
Which way does $D_{C,s}(x)$ move?		
Which variable moves faster?		

Q4 Drag x to try to find fixed points of the dilate function. (Remember, a *fixed point* is a place where x and $D_{C,s}(x)$ come together at the same time.)

What did you find out?

USE DIFFERENT SCALE FACTORS

5. On **page 2** figure out how to attach independent variable x to a polygon.
- Q5** Construct a dilate function and drag or animate x around the polygon. How are the traces of the dependent variable related to the shape of the polygon?
- Q6** Try some different dilate functions, using different center points and different scales. What do you notice about the sizes and shapes of the two traces?
- Q7** On page 3 you can use negative scale factors. When you use a negative scale factor, what do you notice about the motion of the variables?
- Q8** What effect does a negative scale factor have on the shape of the traces?

$s = -1.00$	Drag x left	Drag x up
Which way does $D_{C,s}(x)$ move?		
Which variable moves faster?		
Which makes a bigger design?		

- Q9** What do you think would happen if you make $s = 0.00$? Test your guess.