Circular Grid

Lesson 2

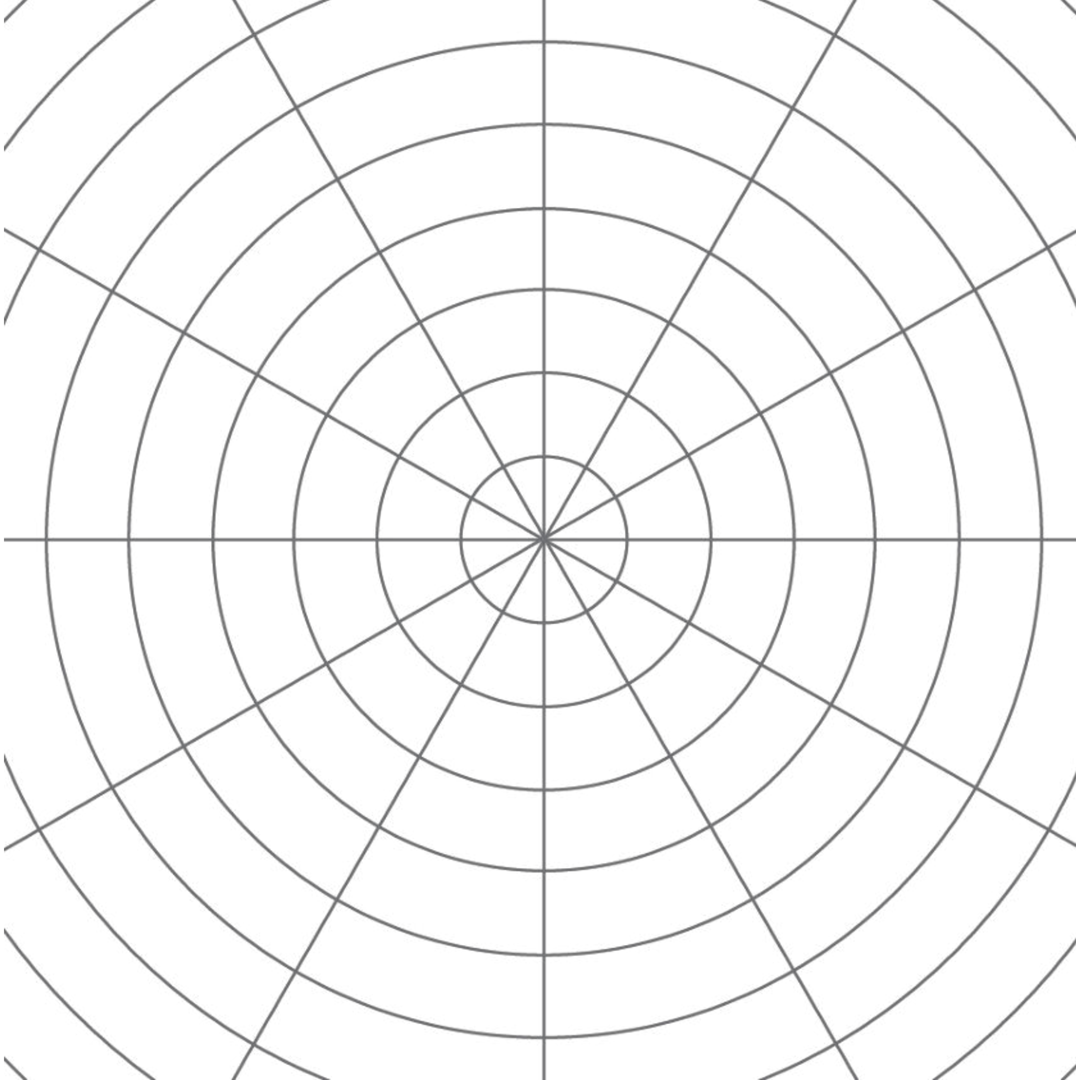
CCSS Standards: Building on	• 3.G.A • 4.MD.C.5
CCSS Standards: Addressing	• 8.G.A

Let's Dilate Figures on Circular Grids!

Notice and Wonder: Concentric Circles

Warm Up 2.1

What do you notice?
What do you wonder?

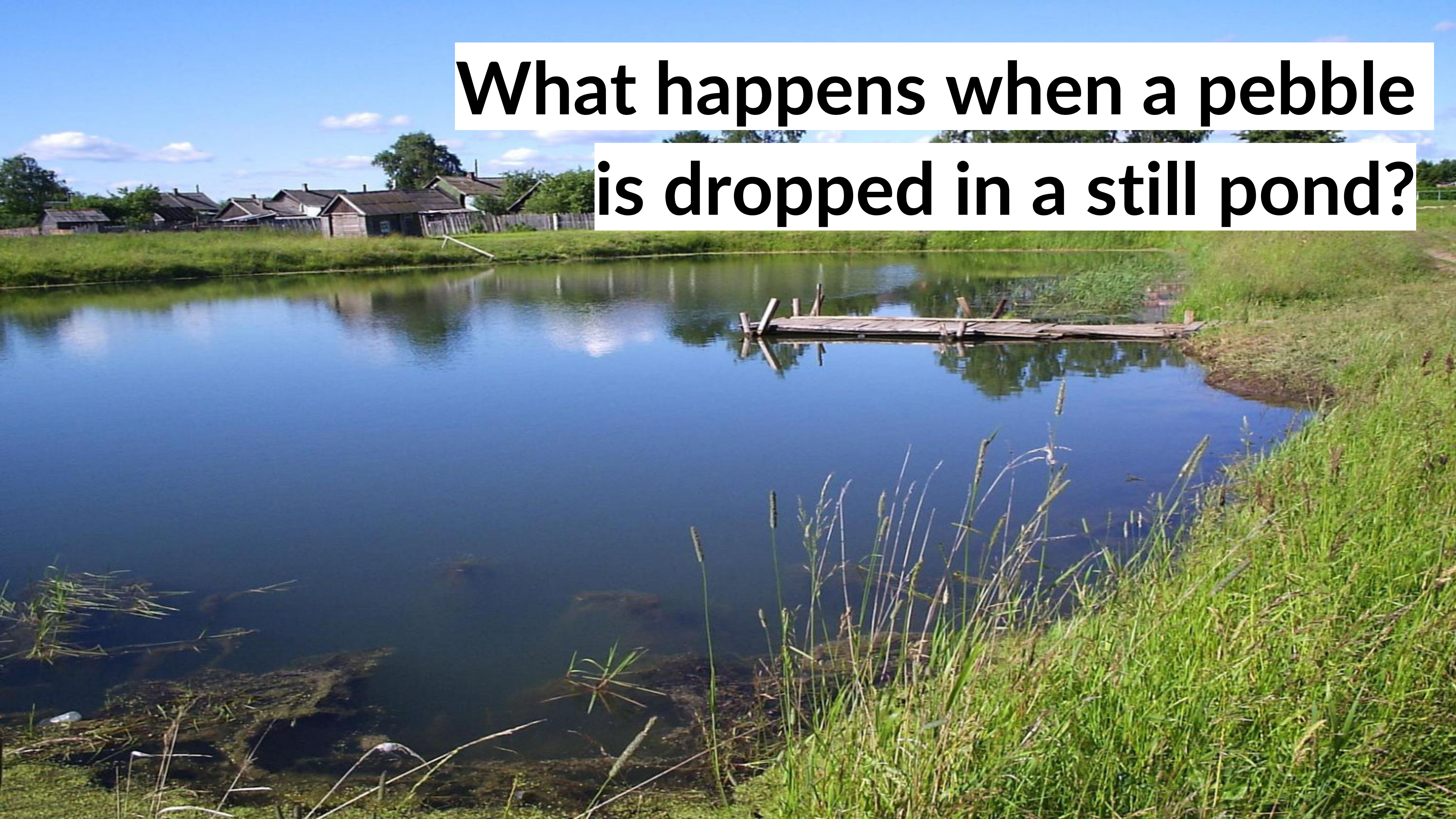


A Droplet on the Surface

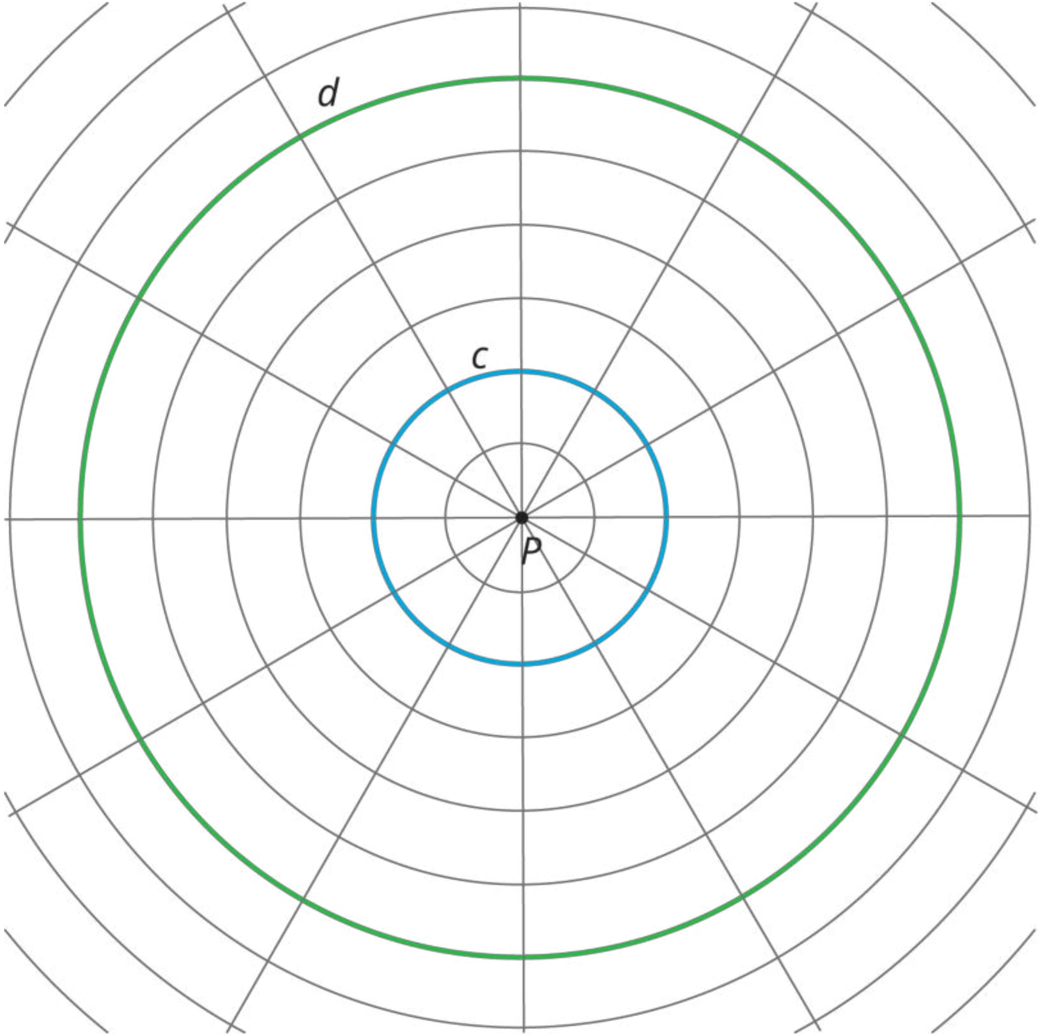
Activity 2.2

- Discussion Supports

What happens when a pebble is dropped in a still pond?

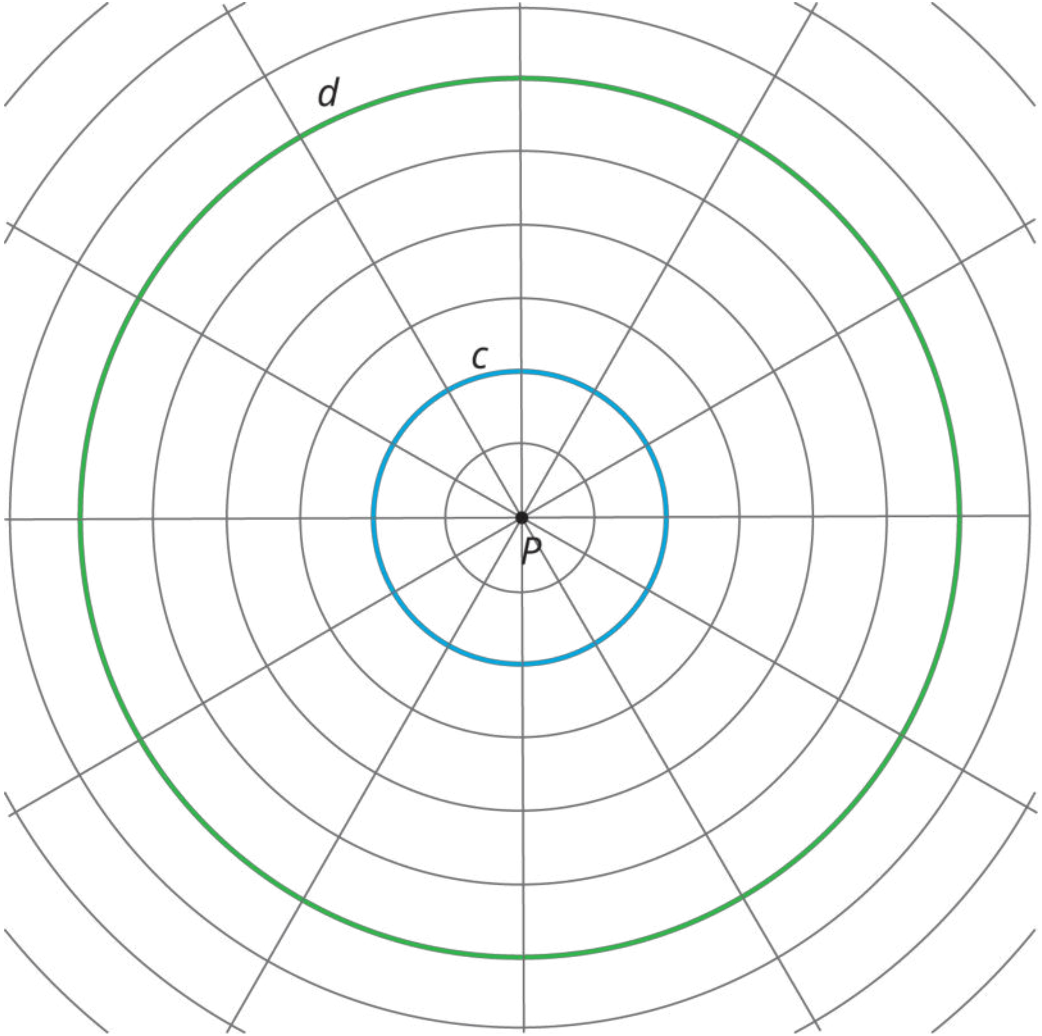


How is this image like a pebble dropped in a still pond?



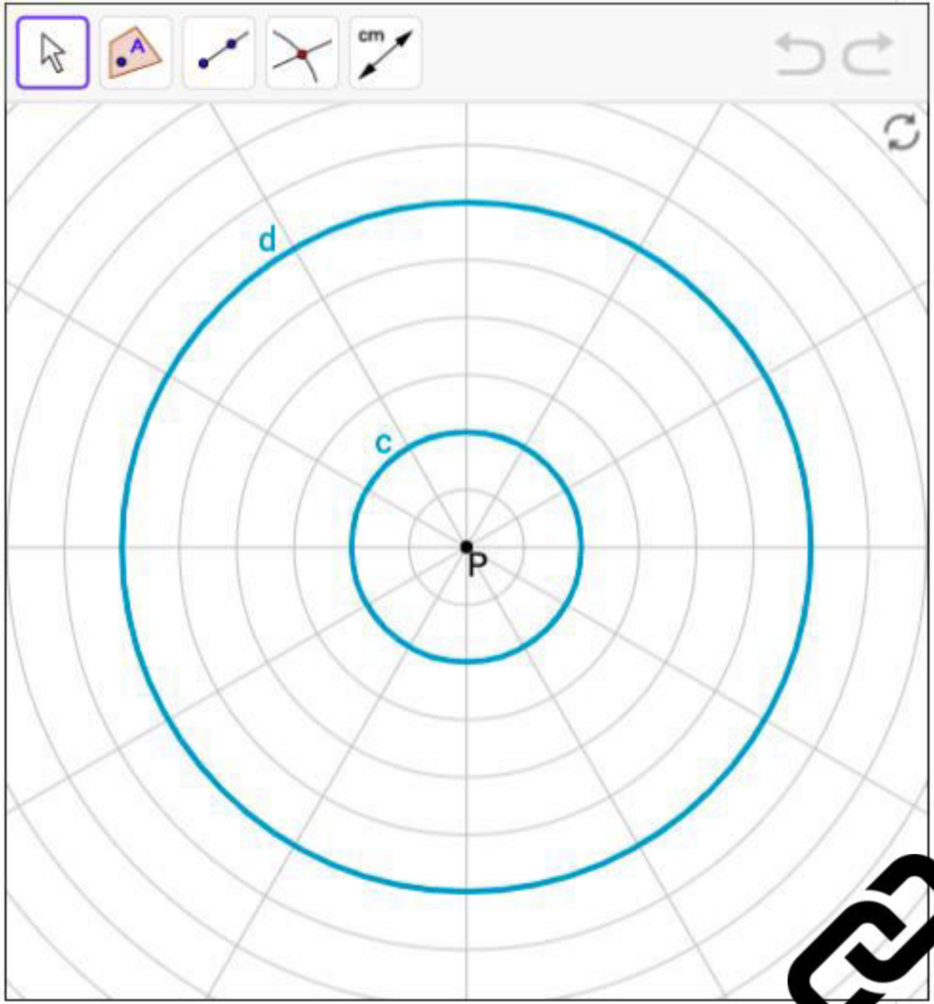
Distance on the circular grid is measured by counting units along one of the rays that starts at the center, *P*.

- **On the circle** means on the curve or on the edge.
- A **ray** starts at a point and goes forever in one direction. Your **rays** will start at *P* and be drawn to the edge of the grid.



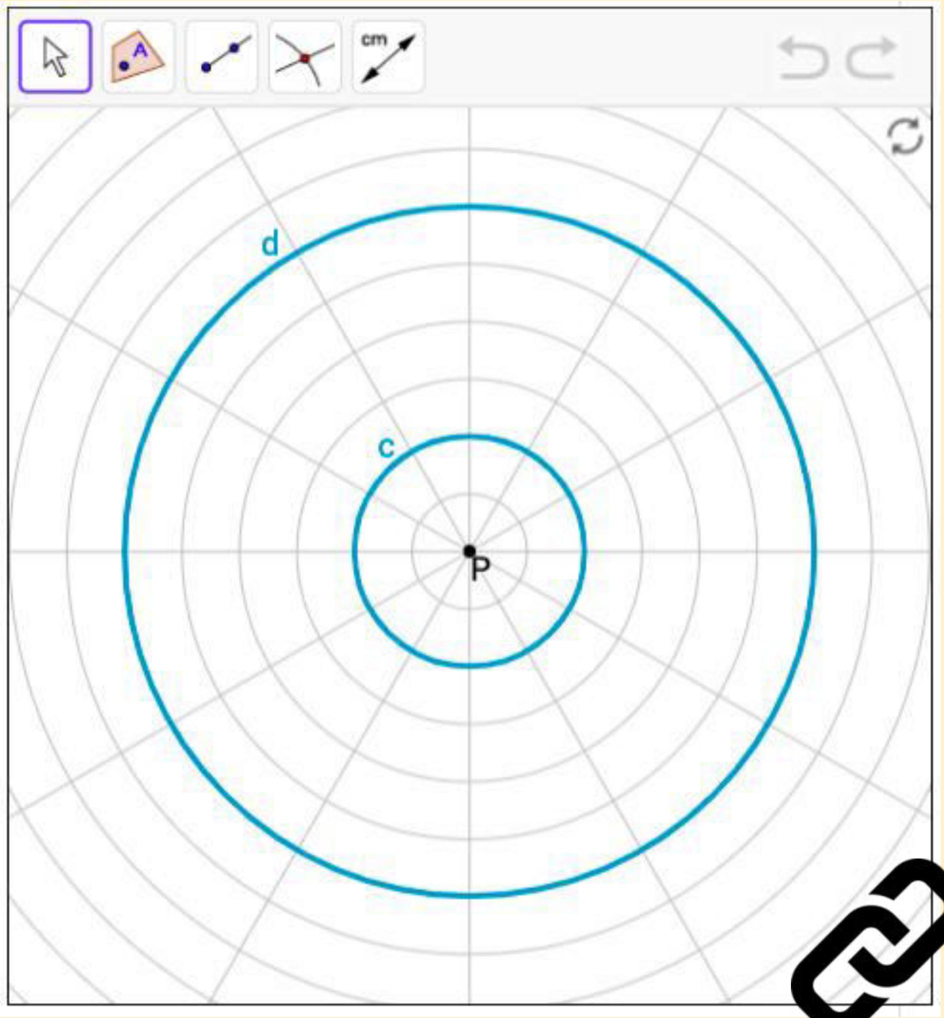
Let’s check out the digital applet!

Please begin working on the questions for this task.



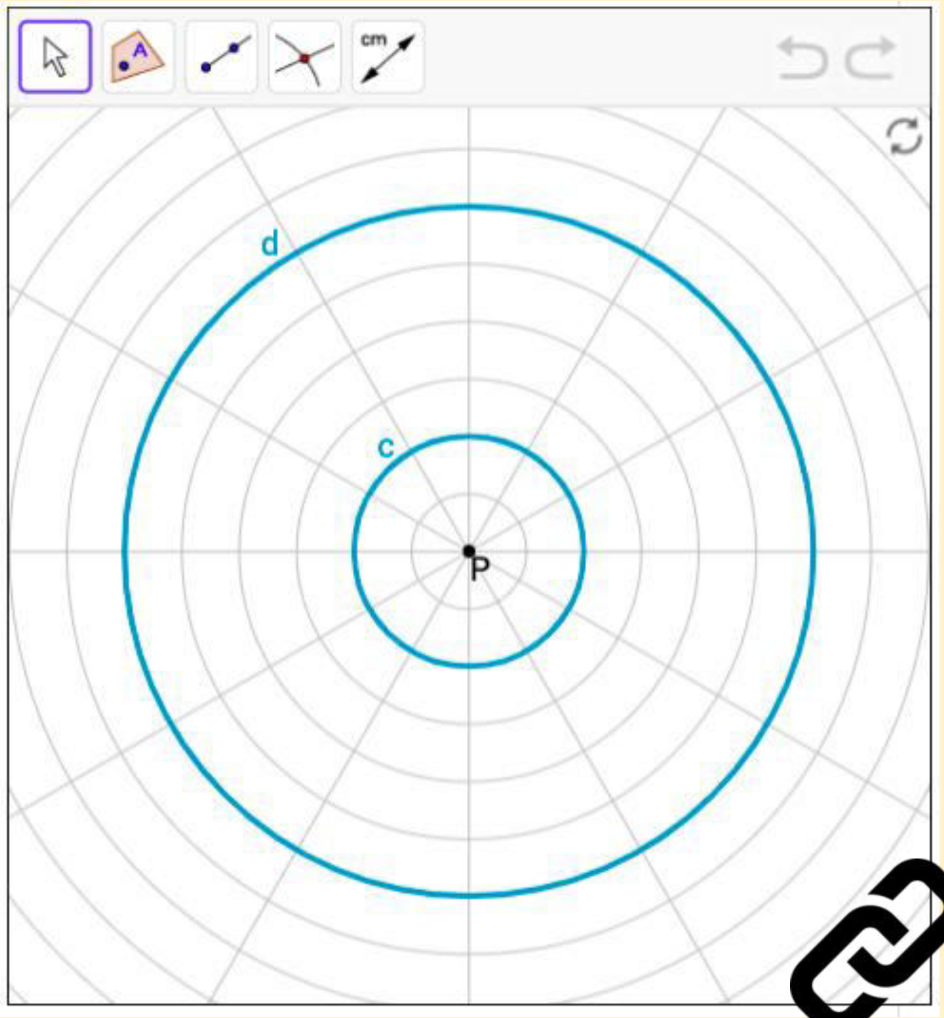
Did you make a strategic choice of points?

- ➔ Why are these points good choices for dilating?

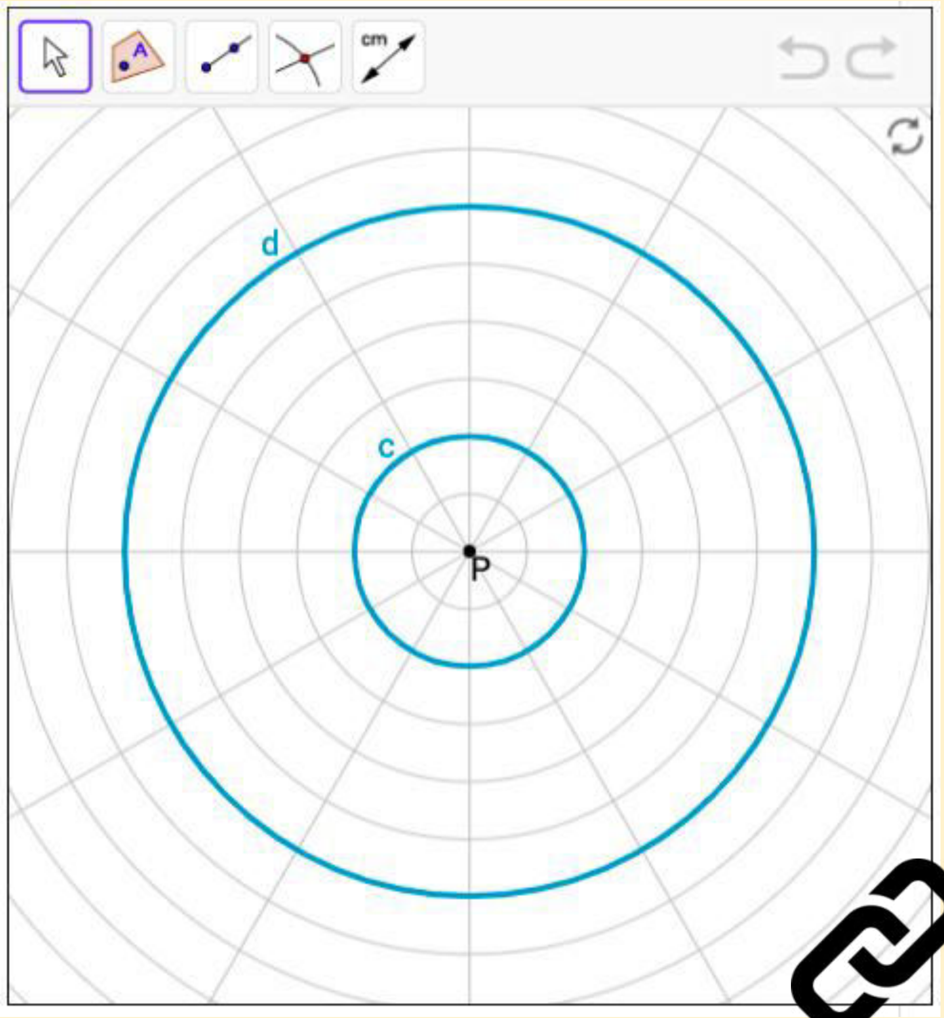


What is the scale factor of this dilation?

★ The large circle (r = 6) is the **dilation** of the small circle (r = 2).



What do you think would happen if a circle were dilated about its center with a scale factor of 2 or 4?



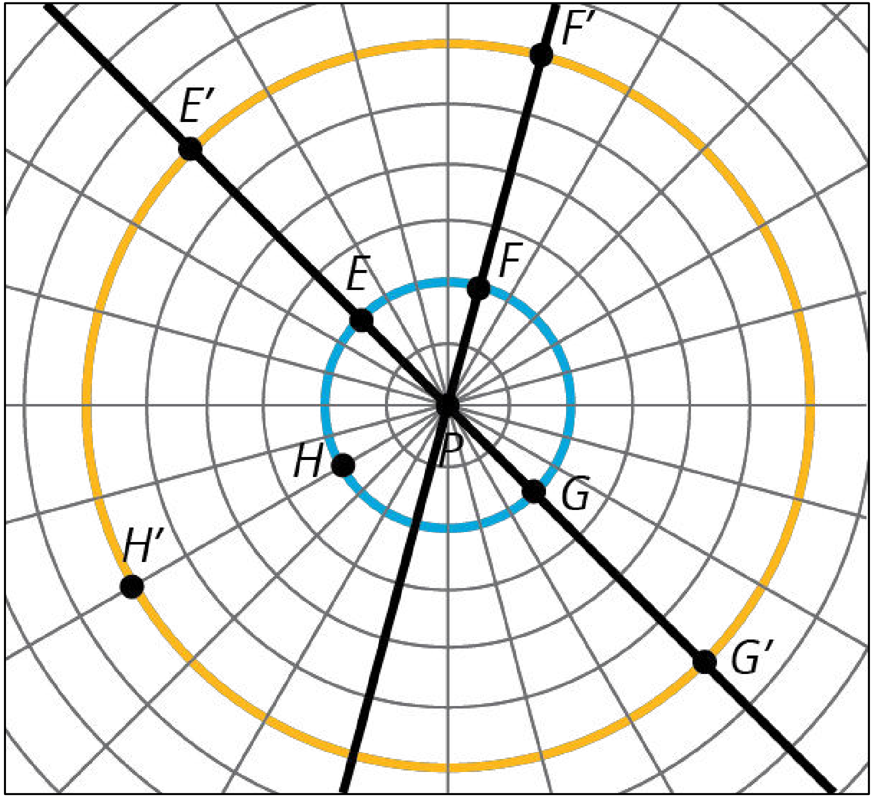
Quadrilateral on a Circular Grid

Activity 2.3

Let’s dilate some points!

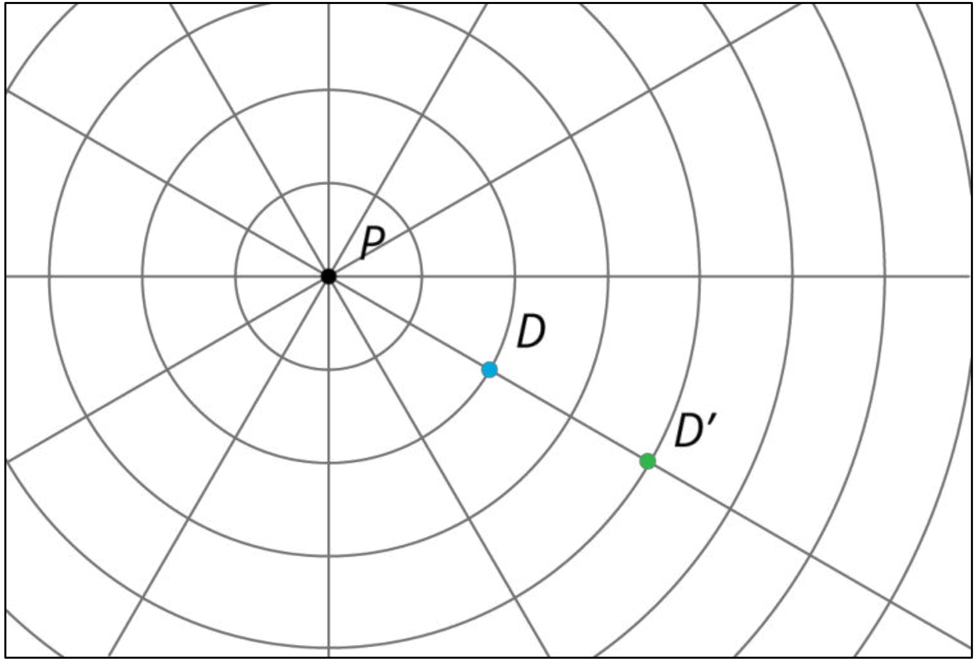
In the previous activity, each point was dilated to its images using a scale factor of 3.

The dilated point was 3 times as far from the center as the original point.

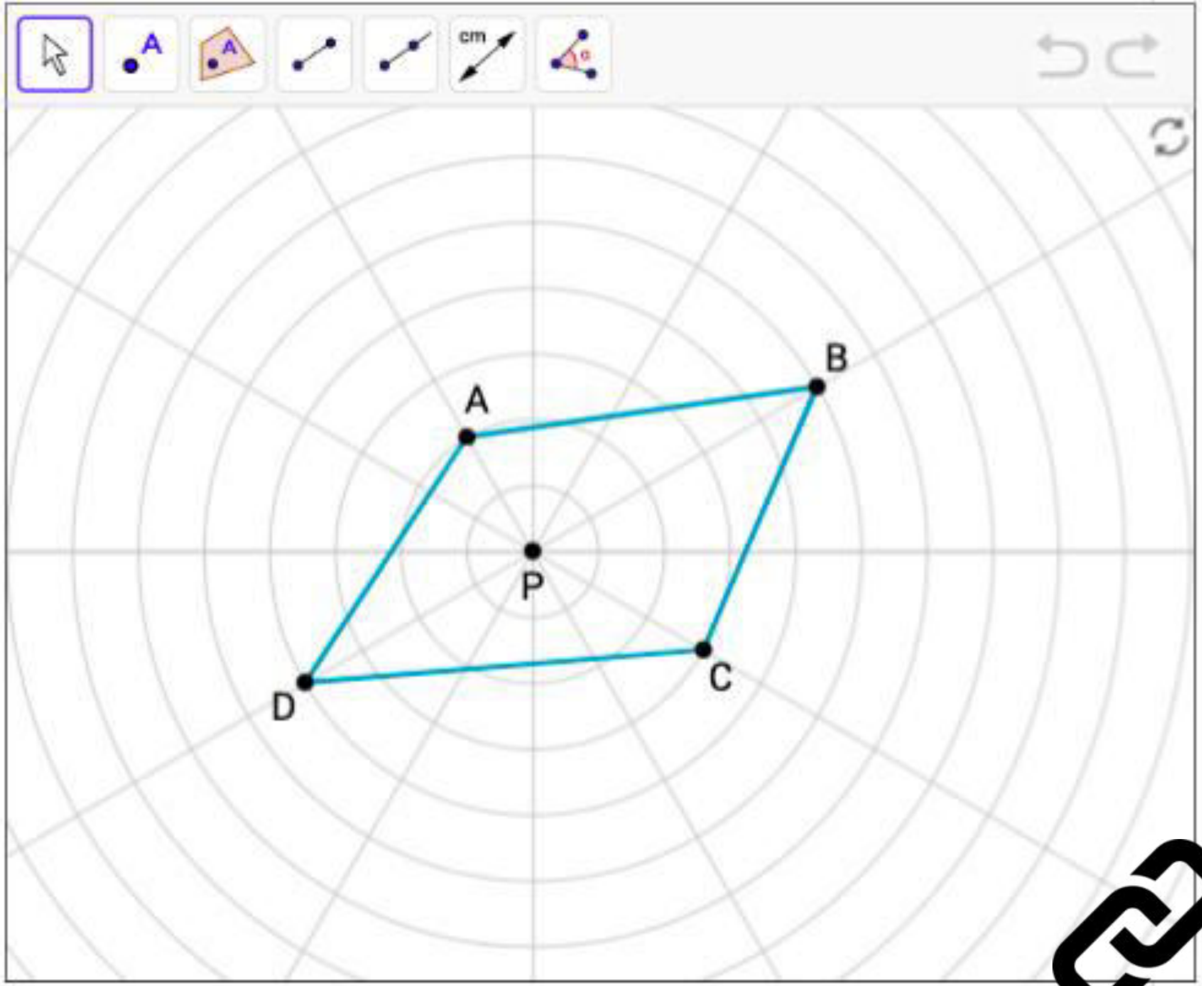


Let’s dilate some points!

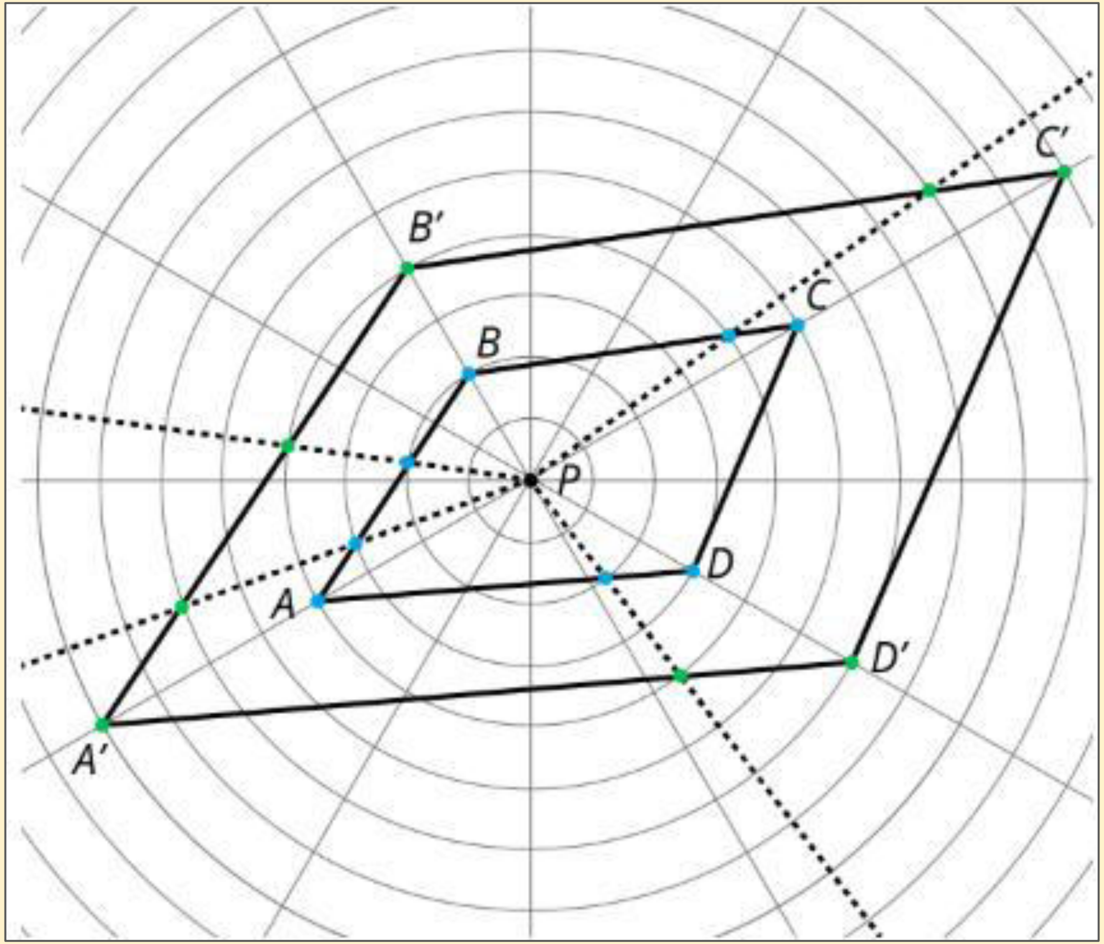
When we dilate point *D* using *P* as the center of dilation and a scale factor of 2, that means we’ll take the distance from *P* to *D* and place a new point on the ray *PD* twice as far away from *P*.



Please begin working on Activity 3!

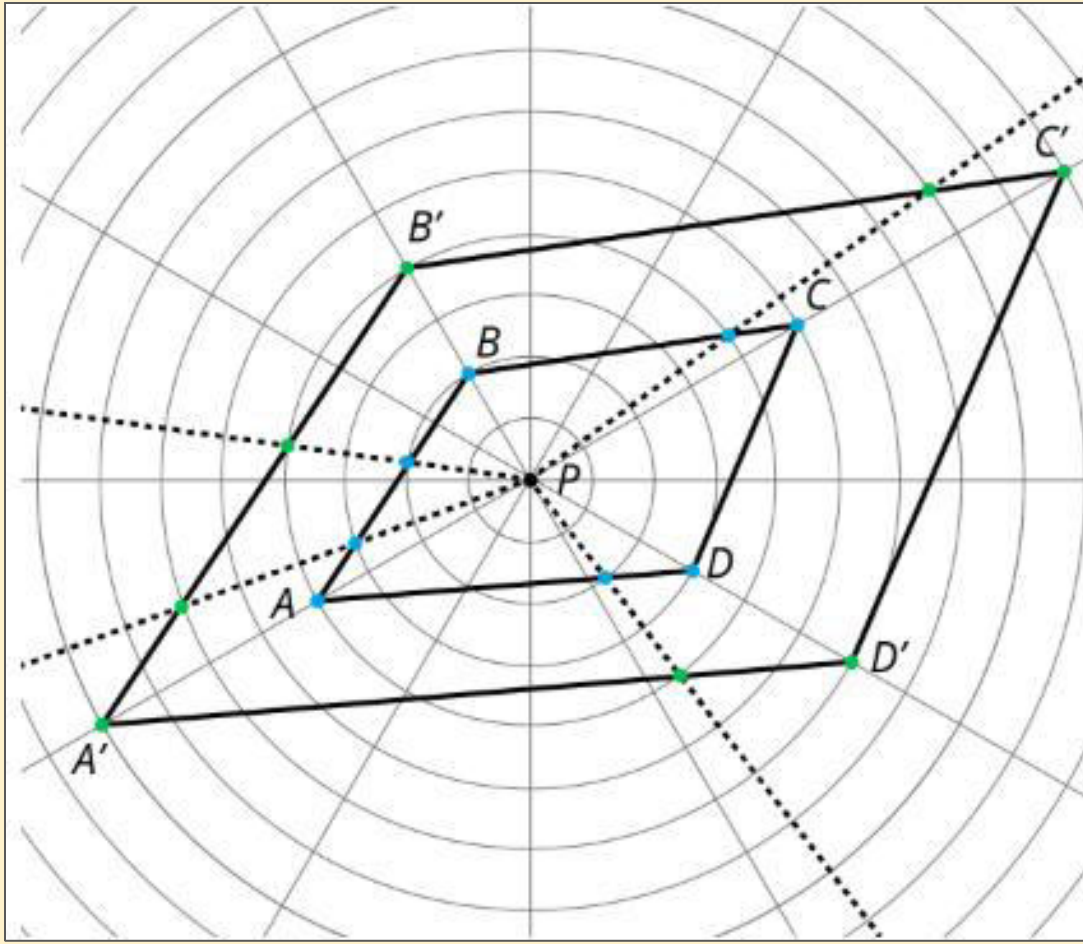


What do you notice about the new polygon?



What happened to the additional points dilated on polygon *ABCD*?

Dilating the polygon's vertices, and then connecting them, gives the image of the entire polygon under the dilation.



“Are you ready for more?”

Suppose *P* is a point not on line segment *WX*. Let *YZ* be the dilation of line segment *WX* using *P* as the center with scale factor 2. Experiment using a circular grid to make predictions about whether each of the following statements must be true, might be true, or must be false.

A. YZ is twice as long as WX.
B. YZ is five units longer than WX.
C. The point *P* is on YZ.
D. YZ and WX intersect.

A Quadrilateral and Concentric Circles

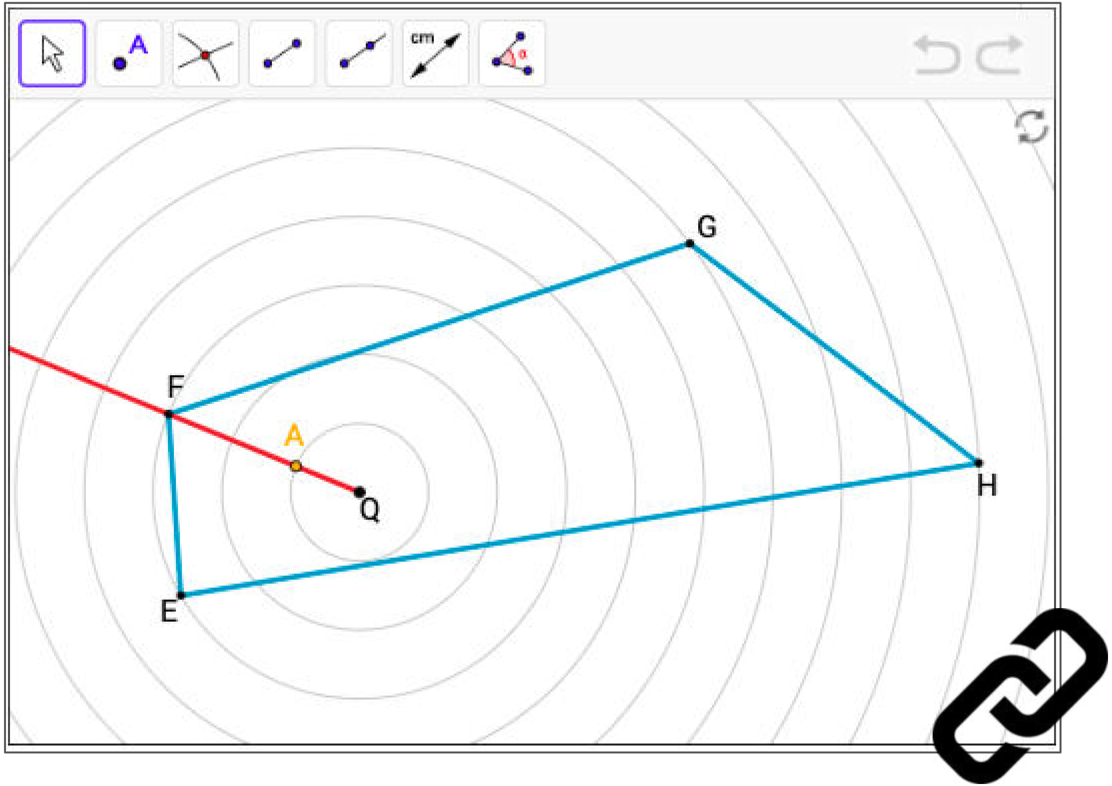
Activity 2.4 (optional)

Read the problem to yourself.

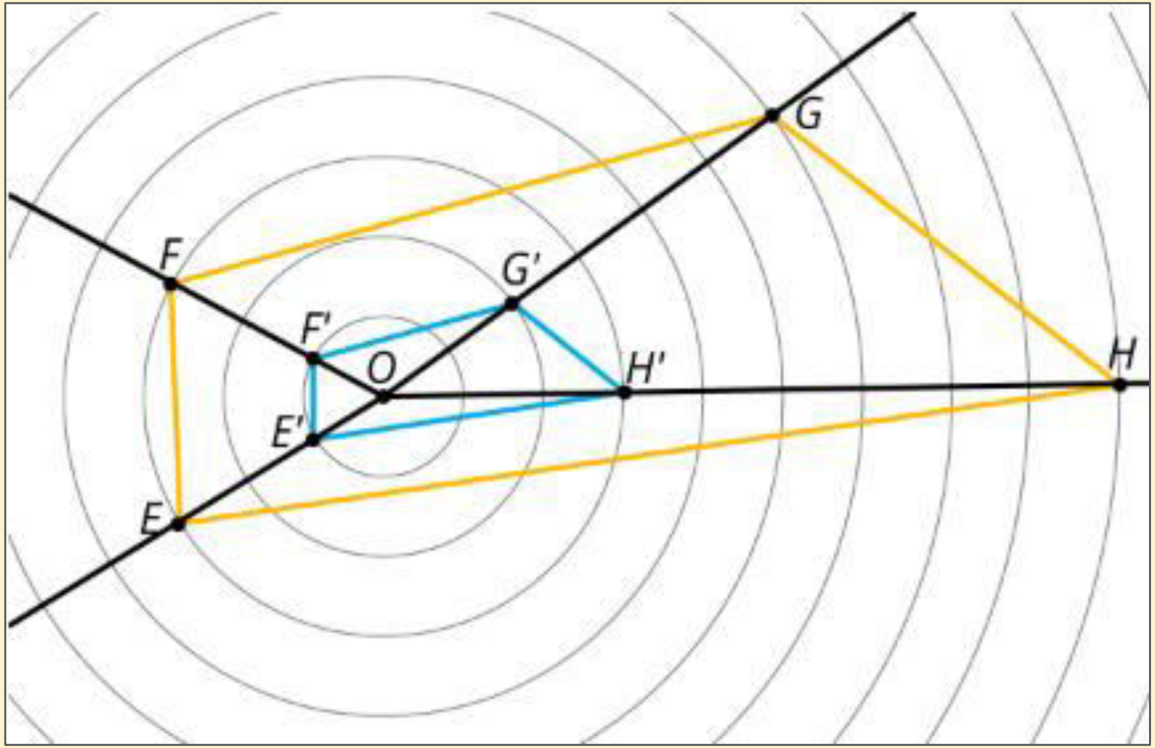
How is this problem similar and different from the preview activity?

Be prepared to share your reasoning.

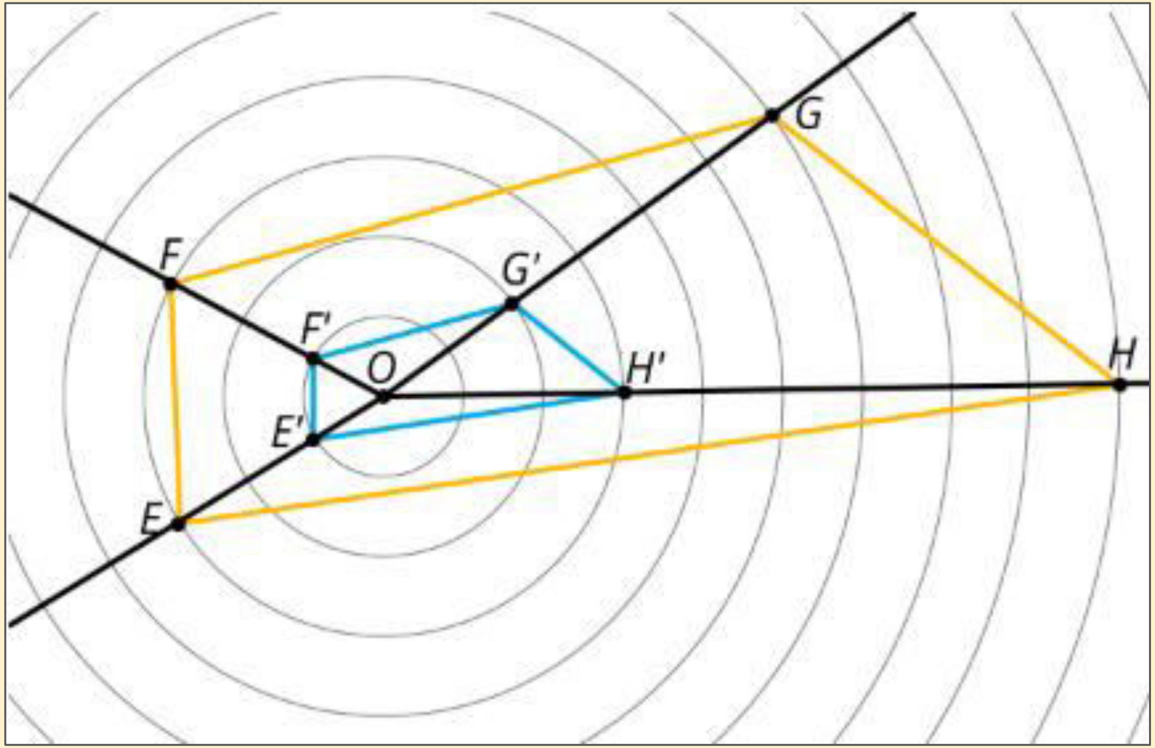
Study how the location of *F'* was determined. Then dilate the remaining points.



Adding line segments joining *E, F, G, H* to the center was necessary in order to find the image of those points in the dilation.



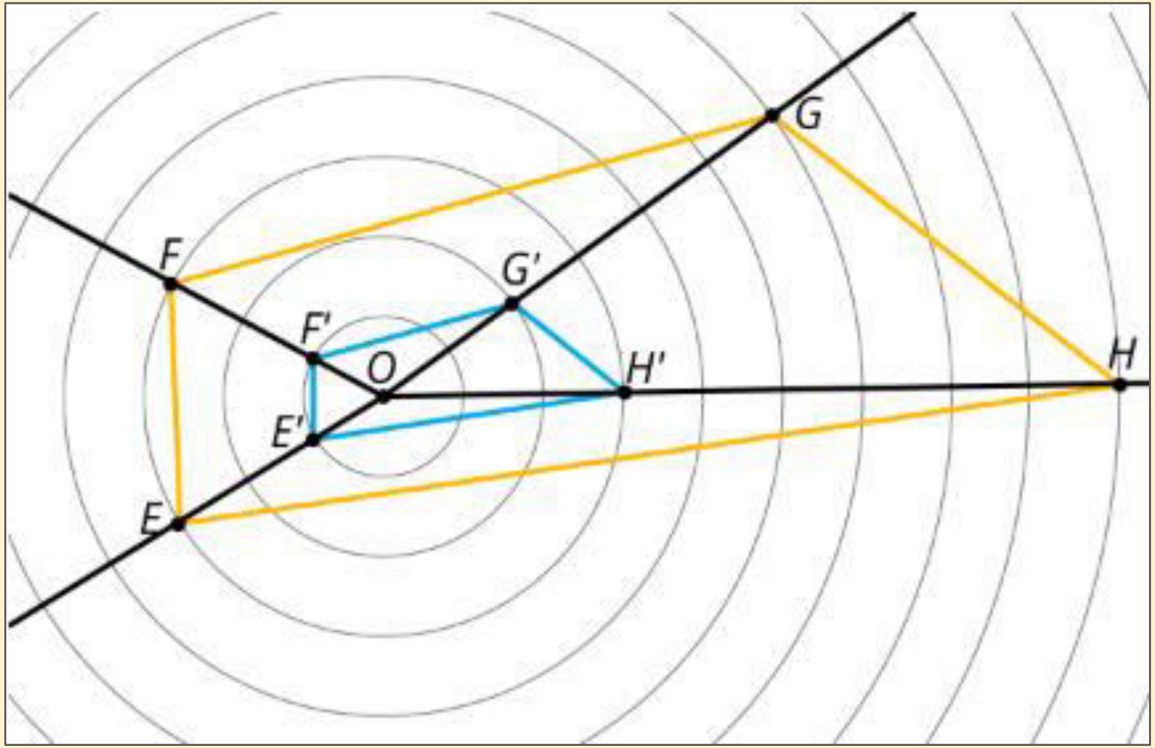
What was the result of the image when using a scale factor of ⅓?



What scale factor would result in no change?

★ Scale factors that are **greater than 1** result in a larger image.

★ Scale factors **less than 1** result in a smaller image.

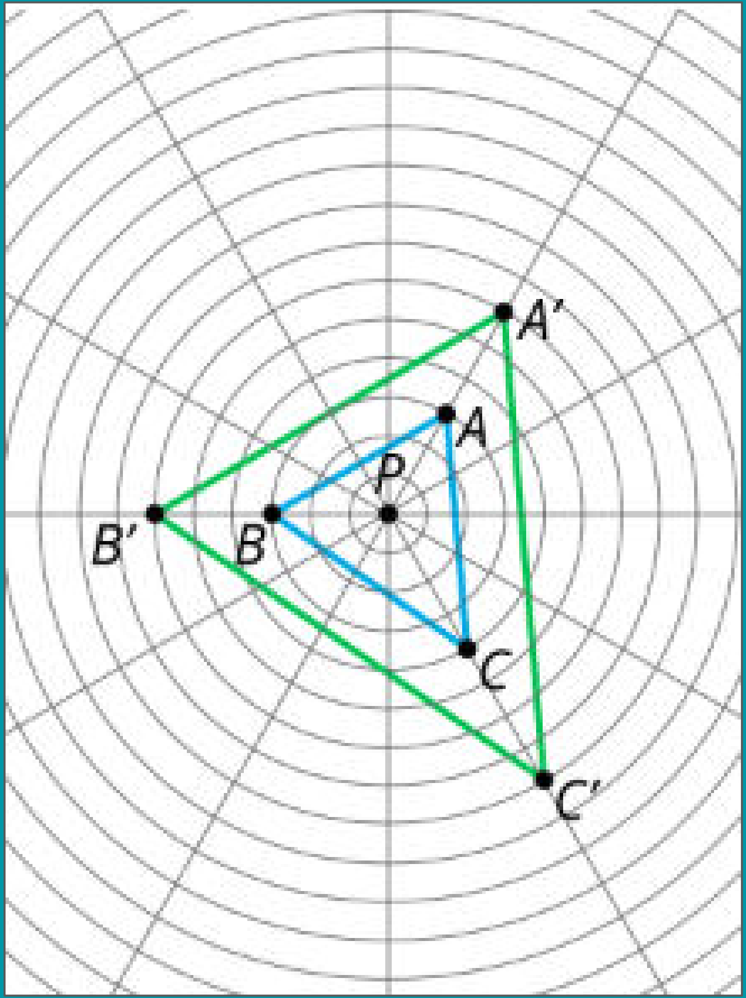


What are some important properties of the circular grid?

How does it help to perform dilations?

To apply a dilation to a polygon, we can dilate the vertices and then add appropriate segments.

How does triangle *A'B'C'* compare to triangle *ABC*?



Today’s Goal

- ❑ I can apply dilations to figures on a circular grid when the **center of dilation** is the center of the grid.

DILATING POINTS ON A CIRCULAR GRID

Cool Down 2.5