



# Dilations Lesson 5: Coordinates

## Student Activity



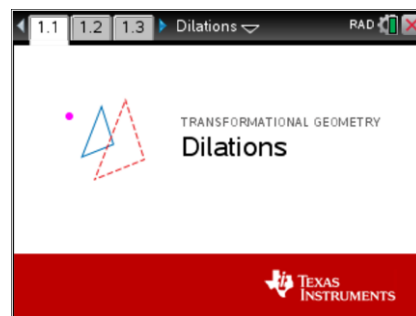
Name \_\_\_\_\_

Class \_\_\_\_\_

In this lesson, you will investigate the relationship between the coordinates of corresponding vertices of triangles dilated about the origin.

Open the document: *Dilations.tns*.

PLAY INVESTIGATE EXPLORE DISCOVER



**It is important that the Dilations Tour be done before any Dilations lessons.**

### Move to page 1.3

On the handheld, press **ctrl** **▶** and **ctrl** **◀** to navigate through the pages of the lesson.

On the iPad®, select the page thumbnail in the page sorter panel.

1. a. Press **menu** to open the menu on the handheld.

(On the iPad, tap on the wrench icon  to open the menu.)

Press **1** (1: Templates) then **5** (5: Grid & Coordinates).

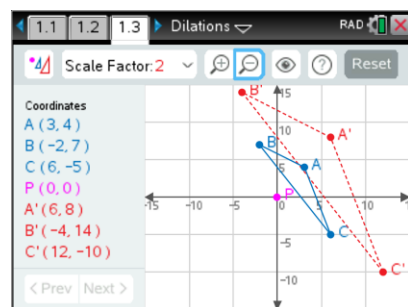
Grab point P (**P**) and move it to the origin, if necessary.

2. Dilate  $\triangle ABC$  about point P with a Scale Factor of 2

( or **D**). Zoom  in (**+**) or out (**-**) as needed.

3. Observe the coordinates and look for patterns.

4. Record these *Original* coordinates (*first coordinates displayed*) in the first row of the table below.



5. a. Investigate the coordinates of corresponding vertices by grabbing and moving each of the three vertices of  $\triangle ABC$  to create different shaped triangles. Record the data.

b. Repeat the above step by creating new triangles for Figures 1-3 in the table below.

c. Move point P and record the coordinates for the vertices in the row labeled 'Figure 4.'

What are the coordinates of point P? \_\_\_\_\_

Record the coordinates of the vertices listed in the table below.

Scale Factor = 2	A	B	C	A'	B'	C'
Original						
Figure 1						
Figure 2						
Figure 3						
Figure 4 (move P)						

6. Make a **conjecture** about the coordinates of the vertices of a triangle and its image under a dilation about the origin. (A **conjecture** is an opinion or conclusion based upon what is observed.)







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




Name \_\_\_\_\_





## Student Activity



Class \_\_\_\_\_

7. Reset the page ( or  ). Grab point P () and move it to the origin, if necessary. Repeat the earlier investigation using a different scale factor. If working with a partner or in a group, each person should choose a different scale factor. If working on your own, use a scale factor of  $\frac{1}{2}$ .

To change the scale factor, press  () and select the scale factor, then press  or . Dilate  $\triangle ABC$  with the scale factor chosen ( or ).

Zoom   in () or out () as needed.

- Create different triangles as before by grabbing and moving the vertices **only**. Record coordinates for three different Figures.
- Move point P and record the coordinates in the row labeled 'Figure 4.'

What are the coordinates of point P? \_\_\_\_\_

Record the scale factor here: **Scale Factor** = \_\_\_\_\_ and the coordinates listed in the table below.

Scale Factor =	A	B	C	A'	B'	C'
Figure 1						
Figure 2						
Figure 3						
Figure 4 (move P)						

- Does your conjecture from question 3 still apply? Compare your results to those of your classmates who used different scale factors.
  - Generalize your conjecture.
8. Suppose that  $\triangle DEF$  were dilated about point P with a scale factor of 5.
- If point P is at the origin and vertex D has coordinates (20, -30), then the coordinates of D' are \_\_\_\_\_.
  - If point P is at the origin and vertex E has coordinates (-5, 10), then the coordinates of E' are \_\_\_\_\_.
  - If point P is at the origin and vertex F' has coordinates (10, 3), then the coordinates of F are \_\_\_\_\_.
  - If point P has coordinates (1, 1) and vertex D has coordinates (3, -1), then the coordinates of D' are \_\_\_\_\_.