Name_____   Date_____

# Dilations on the Coordinate Plane Using Cabri Jr.

This activity utilizes the Cabri Jr. Application that now comes pre-loaded on TI-84 Family calculators. If you do not have Cabri Jr. it is a FREE download from the Texas Instruments website.

Allow students to work individually on this activity. You must send the students the Cabri Jr. file Dilations
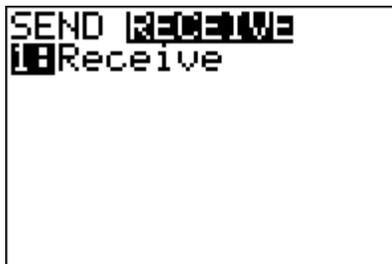
TO SEND/RECEIVE THE FILE:

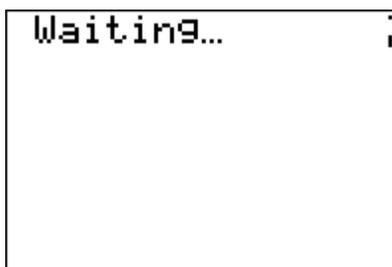Set the receiving calculator up first.

To do this first select 2nd link.

```
SEND RECEIVE
1:All+…
2:All-…
3:Prgm…
4:List…
5:Lists to TI82…
6:GDB…
7↓Pic…
```
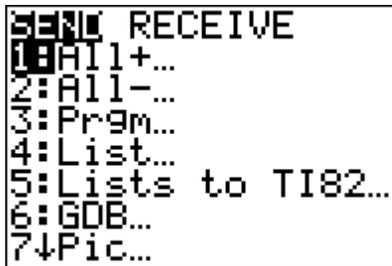
Arrow to the right to highlight the RECEIVE option.

```
SEND RECEIVE
1:Receive
```

Press enter to select this option. You should have a screen that says WAITING…

```
Waiting…
```

As soon as the receiving calculator says WAITING…you can send the file from the calculator that currently has the file.
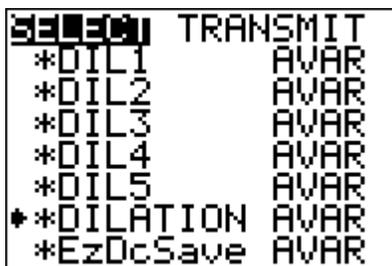
Name_____   Date_____

To Send the file.

Select 2nd Link. Under Send select the 2: All- by pressing enter.

```
SEND RECEIVE
1:All+…
2:All-…
3:Prgm…
4:List…
5:Lists to TI82…
6:GDB…
7↓Pic…
```

Then arrow down to select the Dilations file.

```
SELECT TRANSMIT
 *DIL1      AVAR
 *DIL2      AVAR
 *DIL3      AVAR
 *DIL4      AVAR
 *DIL5      AVAR
◆*DILATION AVAR
 *EzDcSave  AVAR
```

Press enter to select this file.

Arrow over to Transmit and press enter to transmit the file.

```
SELECT TRANSMIT
1:Transmit
```

After students have the file they should be able to work through this activity with ease using the guided student worksheet. Make sure students answer the questions as they are exploring this relationship.

On your TI-84 Plus calculator select the APPS button. Under APPS select the Cabri Jr. Application.

```
APPLICATIONS
1:Finance…
2:ALG1CH5
3:ALG1PRT1
4:AreaForm
5:CabriJr
6:CBL/CBR
7↓CelSheet
```
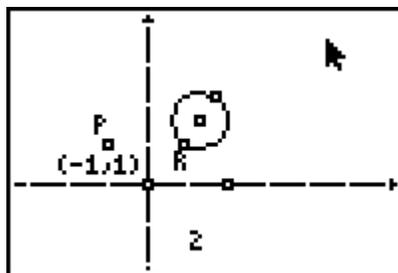
```
Cabri Junior



2.00  © CabriLog
      www.cabri.com
```
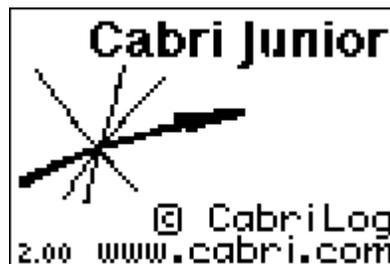
Name_____   Date_____

Press any key to continue.

<u>EXPLORATION:</u>

Let's explore the relationship between a point on a circle, the center of dilation, and the scale factor.
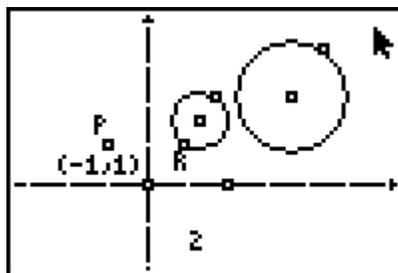
1. Select F1: OPEN, then DILATION.

We want to dilate the circle by a scale factor of 2 about point P.

Q1: What should happen to the circle if you perform this dilation?

The dilated circle should be twice as big.

2. To dilate the circle by a scale factor of 2 about point P, select F4: DILATION. Select point P, the circle, and the scale factor of 2 (in that order).

Name_____   Date_____

3. Now dilate point R. To dilate point R by a scale factor of 2 about point P, select f4: DILATION. Select point P, point R, and the scale factor of 2 (in that order).
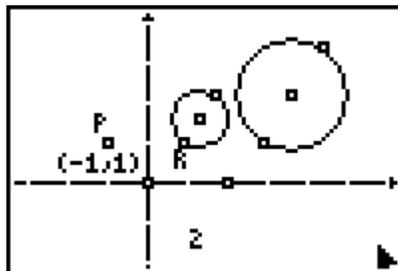
Q2: Do you think there is a relationship between the point of dilation and point R on the original circle and the dilated point R on the dilated circle? If so, what do you think this relationship is?

Answers may vary.

4. Let's explore this question. Create a line through points P and R, create a line through point P and the other point on the circle, and create a line through point P and the center of the circle.   To create these lines, select F2: LINE and then select the points in the appropriate order.
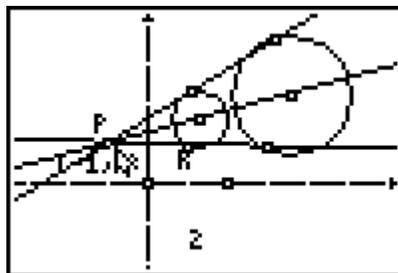
5. To measure the distances from point P to each point on the lines, select F5: MEASURE ▶D. & LENGTH.   Then select the points in the appropriate order.

    Move the measurements away from the line when the measurement with the hand appears on the screen. Repeat this process for all six measurements. You want to measure from point P to every other point on both circles.

Name_____   Date_____
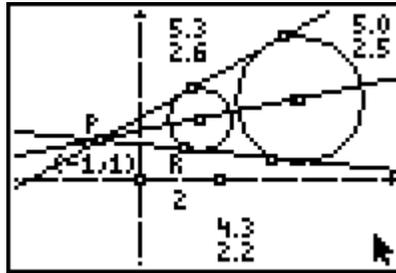
Q3: What relationship do you notice about the distance from point P to the point on the original circle and the distance from point P to the dilated circle?

The distance is twice as far from point P to the new point on the dilated circle as from point P to the point on the original circle.

6.   Let's see if your conclusion from Q3 is correct. To find the ratios of the longer side/shorter side, select F5: CALCULATE. Select the longer side measure by pressing enter. Then select the shorter side by pressing enter. Then press the division sign to perform that operation with these two measures. Do this with each longer side/shorter side relationship on you drawing.
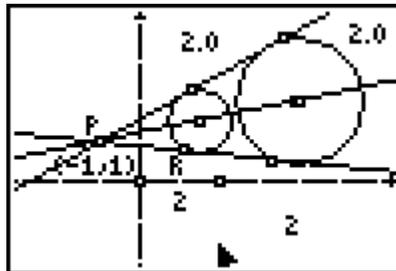
7.   Move point R to see that all the points on the circle are dilated by a scale factor of 2. Are all the points dilated by a scale factor of 2?
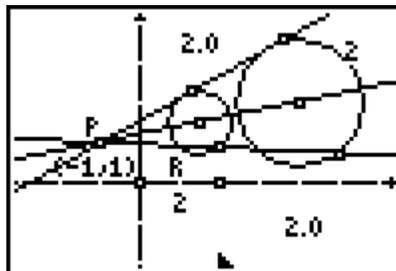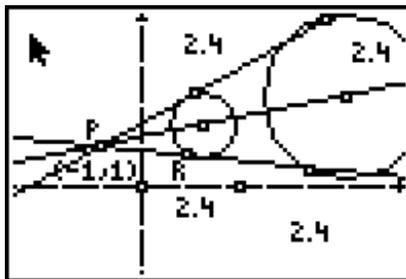

Q4: What is the relationship between the ratios and the dilation factor?

They are the same.

Q5: What should happen to the ratios if you change the dilation factor?

Name_____   Date_____

8.   Move the point on the x-axis to change the scale factor.

Q6: What does happen to the ratios as the scale factor changes?

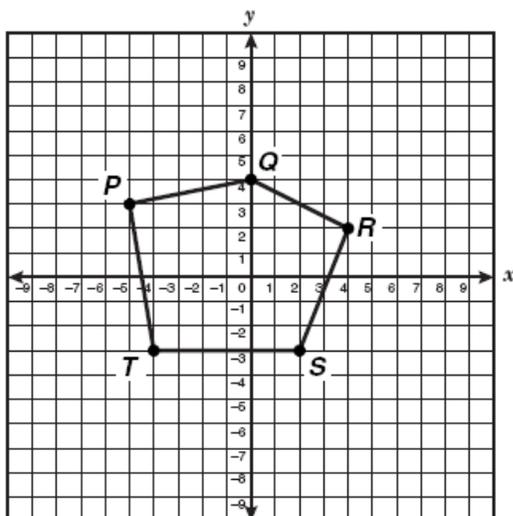**Q7:**   What does this tell you about a dilation? Write a sentence about what it means to dilate a figure about a point that is not the origin.

Check for Understanding: The following are released TAKS question/s to check for students understanding of the lesson.

! Pentagon $PQRST$ is graphed on the coordinate grid below.

Which of the following points would be the location of S' if pentagon $PQRST$ is dilated by a scale factor of 2 and has a center of dilation at $(0, 0)$?

F $(-6, 4)$

G $(2, -6)$

H $(4, -6)$

J $(4, -3)$