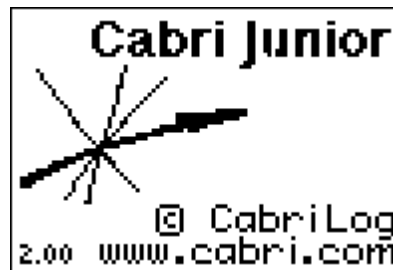


Name _____

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Dilations on the Coordinate Plane Using Cabri Jr.

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

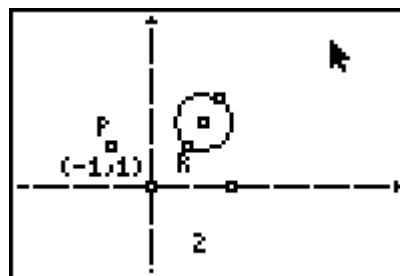


Press any key to continue.

EXPLORATION:

Let's explore the relationship between a point on a circle, the center of dilation, and the scale factor.

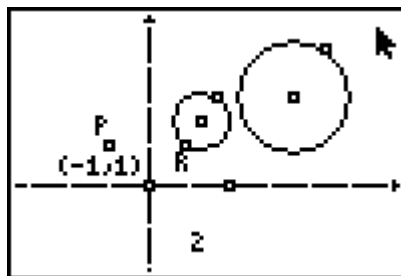
1. Select F1: OPEN, then DILATION.



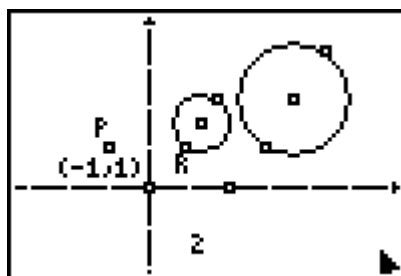
We want to dilate the circle by a scale factor of 2 about point P.

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

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).

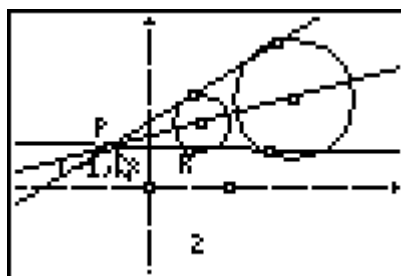


3. Now dilate point R. To dilate point R by a scale factor of 2 about point P, select f4: DILATION. Select point P, point R, and the scale factor of 2 (in that order).



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?

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.

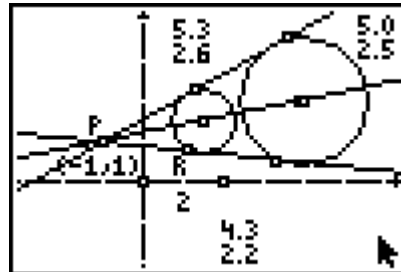


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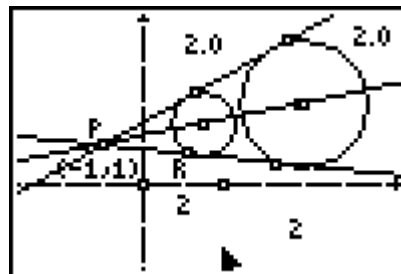
5. To measure the distances from point P to each point on the lines, select F5: MEASURE ► D. & LENGTH. Then select the points in the appropriate order.

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.

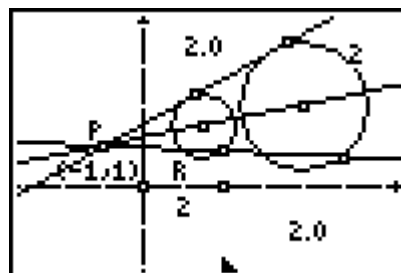


Q3: What relationship do you notice about the distance from point P to the point on the original circle and the distance from point P to the dilated circle?

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 your drawing.



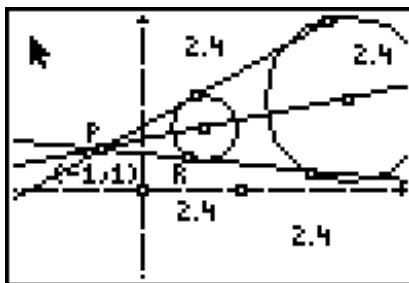
7. Move point R to see that all the points on the circle are dilated by a scale factor of 2. Are all the points dilated by a scale factor of 2?



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

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

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

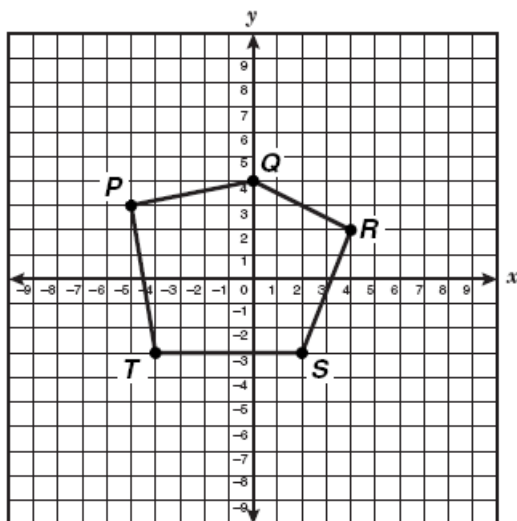


Q6: What does happen to the ratios as the scale factor changes?

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

Check for Understanding:

! 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** $(4, -3)$