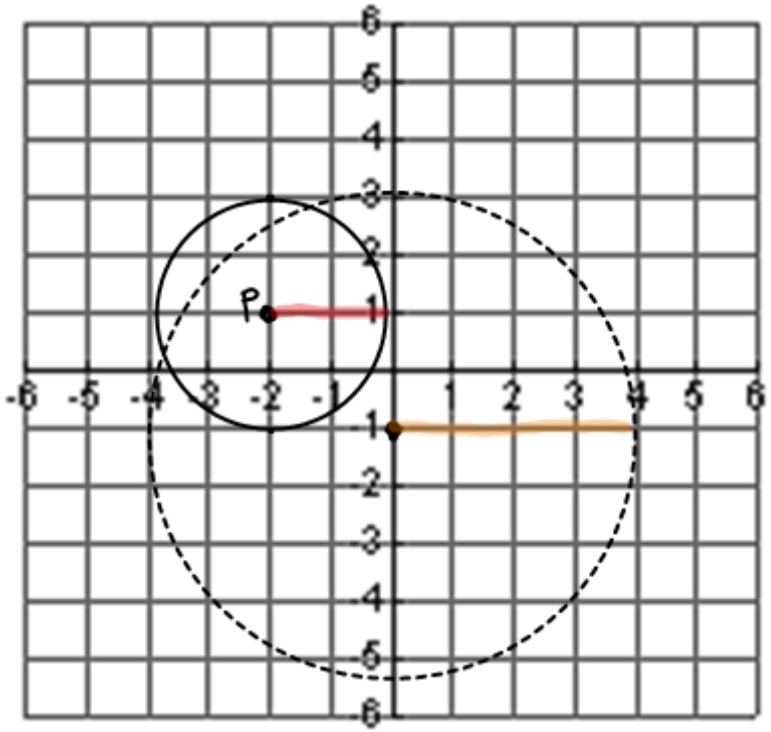
Name Key Date Period

Honors Geometry Unit 8: Circles In-class Activity

Target 8A: Prove that all circles are similar using transformations.
Target 8E: Identify the center and radius of a circle given its equation in standard form

1. Construct Circle P with center at (-2, 1) and radius 2.

2. Construct Circle Q with center at (0, -1) and radius 4.



3. In order to get from Circle P to Circle Q, explain specifically which **transformations** must be done.

(1) Translation of 2 right and 2 down.

(2) Dilation (enlargement) 2 × 2 = 4 ↓ scale factor

4. Are Circles P & Q congruent, similar, or neither? **Explain!**

4. Are Circles P & Q congruent, similar, or neither? **Explain!**

Similar. Why? Because a translation and dilation will transfor 1 ⊙ onto the other, thus making them ≅. And all ≅ ⊙s are similar.

5. **Standard Equation of a Circle**

   a. The standard equation of Circle P is written as $(x+2)^2 + (y-1)^2 = 4$.

   b. The standard equation of Circle Q is written as $x^2 + (y+1)^2 = 16$.

   c. What would the standard equation be for a circle with center at (4, -7) and radius of 5?

$(x-4)^2 + (y+7)^2 = 25$

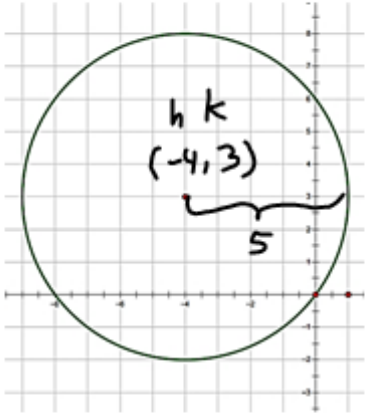
   d. What would the general standard equation of a circle be with center (h, k) and radius r?

$(x-h)^2 + (y-k)^2 = r^2$

6. What is the standard equation of a circle with center (-10, 4) and radius 7?

$(x+10)^2+(y-4)^2=49$

7. Write the equation of the circle to the right.

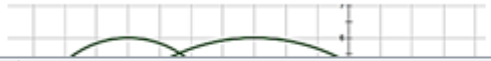


$(x+4)^2+(y-3)^2=25$

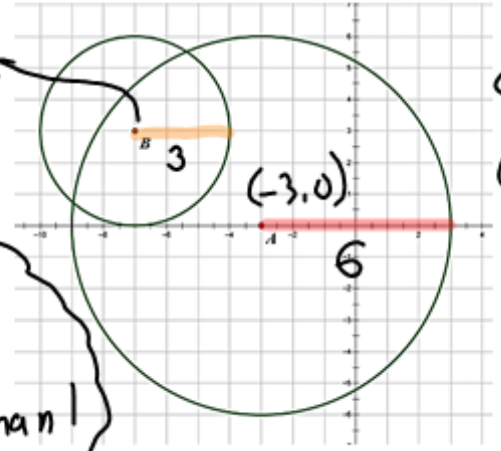
8. Given that the standard equation of a circle is $(x-3)^2+(y+7)^2=100$, what is the **center** of the circle & what is the **radius**?

Center: $(3,-7)$ Radius: $\sqrt{100}=10$

9. Explain why the circles are similar using transformations.



9. Explain why the circles are similar using transformations.



① Translate : 4 left , 3 up

② Dilate: (Reduction)

Scale factor: $\frac{3}{6} = \frac{1}{2}$

$6 \cdot \frac{1}{2} = 3$

↓ scale factor

Enlarge

Scale factor is bigger than 1

Reduce

Scale factor is less than 1

10. Explain why circle F with equation: $(x+5)^2 + (y-2)^2 = 36$ is similar to circle G with equation: $(x-1)^2 + y^2 = 144$.

(-5, 2) r = 6 ⊙F

(1, 0) r = 12 ⊙G

F to G

x y
(-5, 2) 6

x y
(1, 0) 2

Translate : $|-5-1| = |-6| = 6$ to right

$|2-0| = |2| = 2$ down

Dilate : Enlarge ; scale factor 2