

Circles – Circle Transformations

G.C.A.1

Hw Section 12.1

Name _____

#1) George says "Two circles aren't always similar no matter what because you can't map one onto the other using similarity transformations." Why is George wrong?

Two circles can be translated so their centers are concentric. Then dilate one of the circles to match the size of the other.

#2) Two circles A and B have different radii. A student dilates circle A at its center by a scale factor of $\frac{9}{4}$ to make it the same size as circle B. What scale factor could have been used to make circle B the same size as circle A?



Scale factor of $\frac{4}{9}$.

#3) Circle A and circle B are concentric.

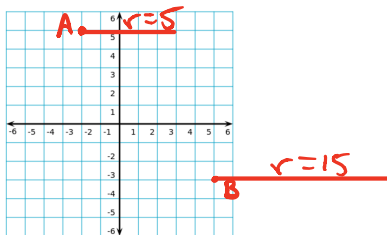
a) What does that mean?

The circles are in the same plane and have the same centers.

b) If the radius of circle A is 24 cm and the radius of circle B is 18 cm. What scale factor would map circle A onto circle B?

$$24 \cdot \frac{18}{24} = 18, \text{ so scale factor} = \frac{18}{24} = \frac{3}{4}$$

#4) To prove similarity between circle A (center at A (-2,5) with radius of 5 cm) and circle B (center at B (5,-3) with radius of 15 cm), Janice translates circle A by vector $\langle 7, -8 \rangle$ and then dilates circle A at point B by a scale factor of 3. Provide two other transformation sequences to establish similarity between these two circles.



(1) First $\langle 7, -8 \rangle$ followed by $D_{A, \frac{1}{3}}(\odot B) = \odot A$

(2) First $\langle -7, 8 \rangle$ followed by $D_{A, \frac{1}{3}}(\odot B) = \odot A$

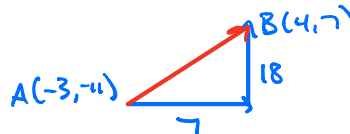
Determine the translation vector that would map the center of circle A onto the center of circle B given the center of each circle.

#5) $\odot A$ with center (-4, 5) to $\odot B$ with center (3, 0)



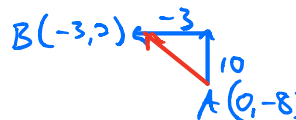
Translation Vector: $\langle 7, -5 \rangle$

#6) $\odot A$ with center (-3, -11) to $\odot B$ with center B (4, 7)



Translation Vector: $\langle 7, 18 \rangle$

#7) $\odot A$ with center (0, -8) to $\odot B$ with center (-3, 2)



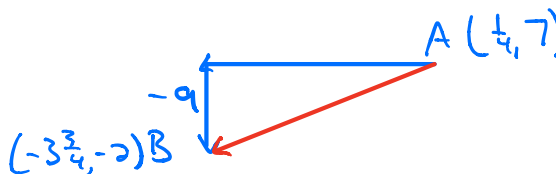
Translation Vector: $\langle -3, 10 \rangle$

#8) $\odot A$ with center (2, 2) to $\odot B$ with center (8, 2)



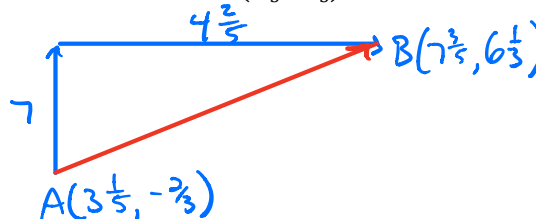
Translation Vector: $\langle 6, 0 \rangle$

#9) $\odot A$ with center $(\frac{1}{4}, 7)$ to $\odot B$ with center $(-3\frac{3}{4}, -2)$



Translation Vector: $\langle -4, -9 \rangle$

#10) $\odot A$ with center $(3\frac{1}{5}, -\frac{2}{3})$ to $\odot B$ with center $(7\frac{3}{5}, 6\frac{1}{3})$



Translation Vector: $\langle 4\frac{2}{5}, 7 \rangle$

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What scale factor would make circle A the same size as circle B?

#11) Radius_A = 2 cm, Radius_B = 4 cm, Scale Factor: 2

#12) Radius_A = 12 cm, Radius_B = 3 cm, Scale Factor: $\frac{1}{4}$

#13) Radius_A = 6 cm, Radius_B = 8 cm, Scale Factor: $\frac{4}{3}$

#14) Diameter_A = 8 cm, Radius_B = 1 cm, Scale Factor: $\frac{1}{4}$
 radius_A = 4

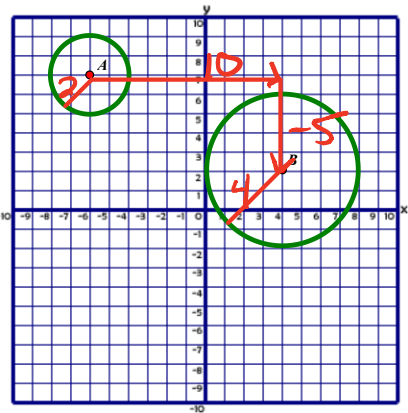
#15) Radius_A = 12 cm, Diameter_B = 8 cm, Scale Factor: $\frac{1}{3}$
 radius_B = 4

#16) Radius_A = 7 cm, Radius_B = 6 cm, Scale Factor: $\frac{6}{7}$

Determine the translation vector and scale factor of the dilation for the following similarity transformations.

#17) Circle A to Circle B

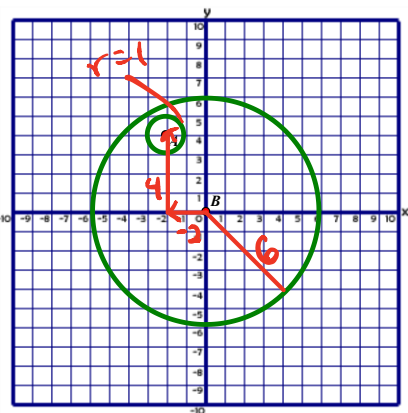
Translate Vector $\langle 10, -5 \rangle$, $D_B, 2 (\odot A) = \odot B$



SF = $\frac{4}{2} = 2$

#18) Circle B to Circle A

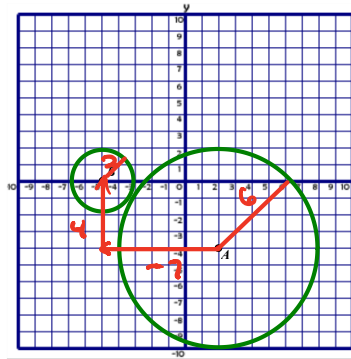
Translate Vector $\langle -2, 4 \rangle$, $D_A, \frac{1}{6} (\odot B) = \odot A$



SF = $\frac{1}{6}$

#19) Circle A to Circle B

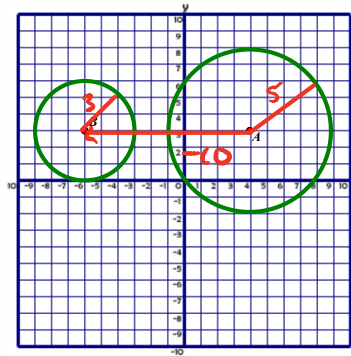
Translate Vector $\langle -7, 4 \rangle$, $D_B, \frac{1}{3} (\odot A) = \odot B$



SF = $\frac{1}{3}$

#17) Circle A to Circle B

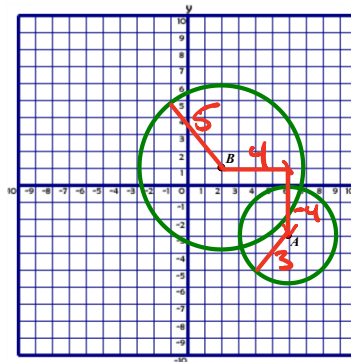
Translate Vector $\langle -10, 0 \rangle$, $D_B, \frac{3}{5} (\odot A) = \odot B$



SF = $\frac{3}{5}$

#18) Circle B to Circle A

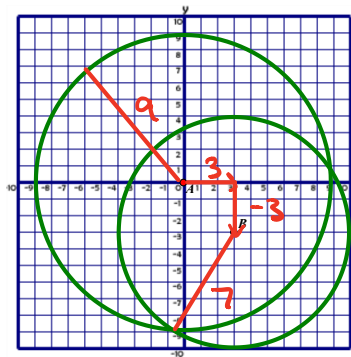
Translate Vector $\langle 4, -4 \rangle$, $D_A, \frac{3}{5} (\odot B) = \odot A$



SF = $\frac{3}{5}$

#19) Circle A to Circle B

Translate Vector $\langle 3, -3 \rangle$, $D_B, \frac{7}{9} (\odot A) = \odot B$



SF = $\frac{7}{9}$