Name _____

Worksheet 9.4b

Additional Practice with Rotations & Reflections

1. Multiple Reflections I

a. Find the transformation matrix for a reflection over the line $y = \sqrt{3}x$.

b. Graph this line of reflection in the grid provided. Note: the grid contains a unit circle with "special angles" identified.

c. Use your matrix from part (a) to find the image of the point $P(3,1)$. Call this image P'. Plot both P and P'.

d. Find the transformation matrix for a reflection over the line $y = x$ and graph this line.

e. Use your matrix from part (d) to find the image of P'. Call this image P'' and plot it (note: P'' is the image of the original point P after both transformations).

f. What is the angle between ϕ in part (a) and ϕ in part (d)? _____

g. Find the angle of rotation that achieves, in a *single* transformation, the reflection in (a) *followed by* the reflection in (d). Be sure to state the direction and center point of rotation. Identify this angle in your sketch.

h. What's the relationship between your answers to part (f) and part (g)?

2. Multiple Reflections II

a. Find the transformation matrix for a reflection over the line $y = \frac{1}{\sqrt{3}}x$.

b. Graph this line of reflection in the grid provided. Note: the grid contains a unit circle with "special angles" identified.

c. Use your matrix from part (a) to find the image of the point $P(3,1)$. Call this image P'. Plot both P and P'.

d. Find the transformation matrix for a reflection over the line $y = \sqrt{3}x$ and graph this line.

e. Use your matrix from part (d) to find the image of P'. Call this image P'' and plot it. (note: P'' is the image of the original point P after both transformations).

f. What is the angle between ϕ in part (a) and ϕ in part (d)? _____

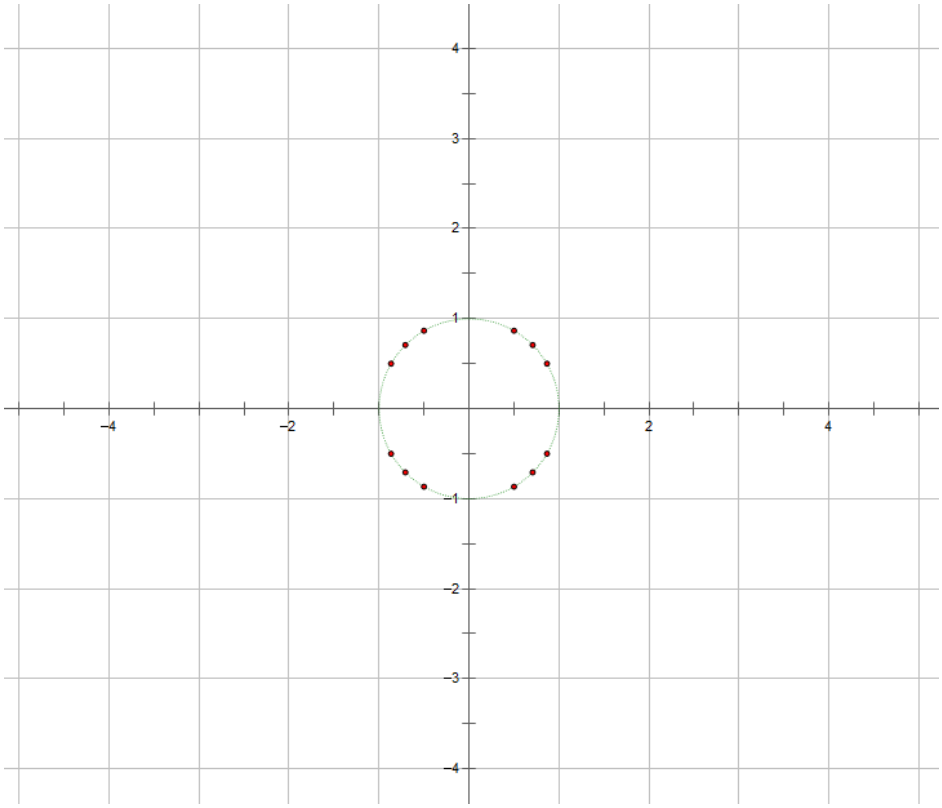
g. Find the angle of rotation that achieves, in a *single* transformation, the reflection in (a) *followed by* the reflection in (d). Be sure to state the direction and center point of rotation. Identify this angle in your sketch.

h. What's the relationship between your answers to part (f) and part (g)?

Answer ONLY after completing #1 and #2

What would be true about the rotation if we were to change the order of the reflections on #1 and #2?

For Multiple Reflections I



For Multiple Reflections II