Pre Calc BC **Transformations** **Name:**

1. Determine the transformation represented by each matrix (some are compositions). (*If you can't "see it" right off, get some graph paper, make a* <u>*scalene*</u> *triangle, create a 3x2 matrix of the vertex coordinates, multiply by the transformation matrix and analyze the image. DO NOT JUST COPY FROM YOUR NOTES!)*

a) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ b) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ c) $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ d) $\begin{bmatrix} 3 & 0 \\ 0 & -3 \end{bmatrix}$

2. Create a 2x2 matrix that corresponds to each of the following transformations.

a) R_{180° b) R_{-90° c) $D_{x-axis}x2$ d) $r_{y=-x}$

3. Perform the indicated composition by multiplying the relevant transformation matrices and then analyzing the result. *(Remember, compositions proceed from right to left, but the matrices should be multiplied from left to right).*

a) $r_{x-axis} \circ R_{180^\circ}$

b) $R_{90^\circ} \circ r_{y-axis}$

c) $r_{y-axis} \circ r_{y-axis}$

4. A triangle has coordinates A(2,1); B(7,1); C(7,4). Find the new coordinates after a rotation of 140°.

5. Prove using matrices and angle addition formulas that $R_{\alpha} \circ R_{\beta} = R_{\alpha+\beta}$

6. Write a matrix for each transformation and then multiply to find the composition.

a) $R_{60^{\circ}} \circ r_{y=x}$

b) $R_{45^{\circ}} \circ r_{y-axis}$