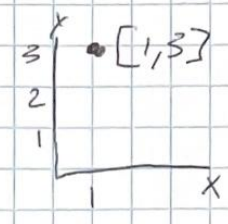
Name: Rachel Collier

Total score: 100
Class PARTICIPATION on Lecture 4.doc **ANSWER SHEET**
(Out of 100 points. Please record your own total score!)
(Attach as score.doc!)
Answers a - f on the graph paper

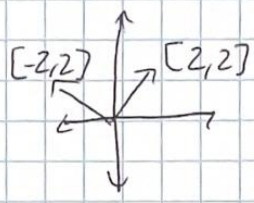
Rachel Collier

a. $\begin{bmatrix} 1 & 0 & 7 \\ 0 & 1 & 9 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 3 \\ 1 \end{bmatrix} = \begin{bmatrix} 8 \\ 12 \\ 1 \end{bmatrix}$

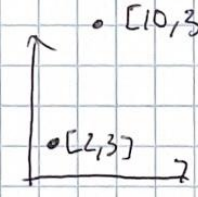


b. $\begin{bmatrix} \cos(\pi/2) & -\sin(\pi/2) & 0 \\ \sin(\pi/2) & \cos(\pi/2) & 0 \\ 0 & 0 & 1 \end{bmatrix} =$

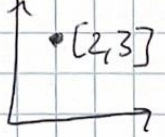
$\begin{bmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 2 \\ 1 \end{bmatrix} = \begin{bmatrix} -2 \\ 2 \\ 1 \end{bmatrix}$



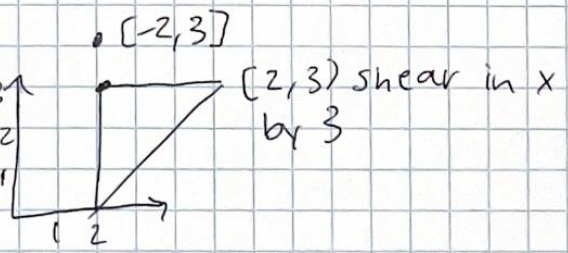
c. $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 30 \\ 1 \end{bmatrix}$



d. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} = \begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix}$



e. $\begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} = \begin{bmatrix} 5 \\ 3 \\ 1 \end{bmatrix}$



f. $\begin{bmatrix} 1 & 0 & 6 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

$\begin{bmatrix} 1 & 0 & 6 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1/\sqrt{2} & -1/\sqrt{2} & 0 \\ 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 1/\sqrt{2} & -1/\sqrt{2} & 6 \\ 1/\sqrt{2} & 1/\sqrt{2} & 0 \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 6 - 1/\sqrt{2} \\ 1/\sqrt{2} \\ 1 \end{bmatrix}$

a. **(10 points) Translate [1,3] by [7,9]**

1. Write the Translation Matrix using homogeneous coordinates (hint: **3 X 3**)

2. Premultiply the Translation Matrix with point **[1, 3]** and **DRAW** its new location.

b. **(10 points) Rotate [2,2] by 90° (π/2)**

1. Write the Rotation Matrix using homogeneous coordinates (hint: **3 X 3**)

2. Premultiply the Rotation Matrix with point **[2, 2]** and **DRAW** its new location

c. **(10 points) Scale [2,3] by 5 in the X direction and 10 in the Y direction**

1. Write the Scaling Matrix using homogeneous coordinates (hint: **3 X 3**)

2. Premultiply the Scaling Matrix with point **[2, 3]** and **DRAW** its new location

d. **(10 points) Reflect [2,3] in the X direction**

1. Write the Reflection Matrix using homogeneous coordinates (hint: **3 X 3**)

2. Premultiply the Reflection Matrix with point **[2, 3]** and **DRAW** its new location

e. **(10 points) Shear [2,3] in the X direction by 3**

1. Write the Shear Matrix using homogeneous coordinates (hint: **3 X 3**)
2. Premultiply the Shear Matrix with point **[2, 3]** and **DRAW** its new location

$\cos 45 = 1/\sqrt{2}$

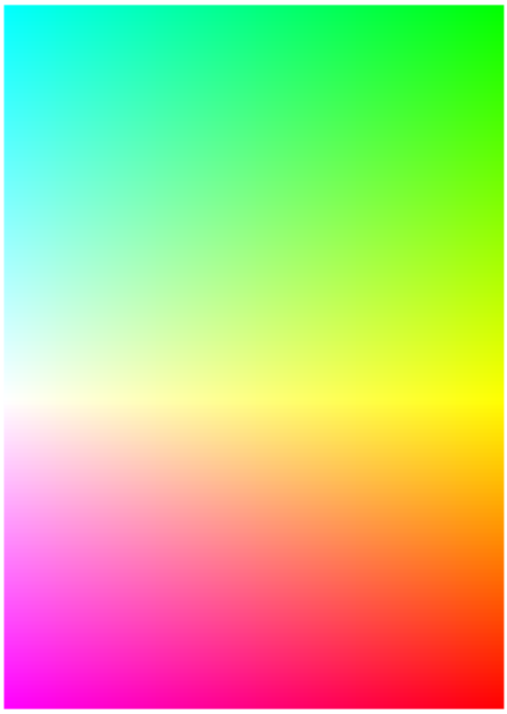
$\sin 45 = 1/\sqrt{2}$

f. **(10 points) Calculate the Transformation Matrices [0, 1]**

1. **Translate by [6, 0]** then **Rotate 45^0**

2. **Rotate 45^0** then **Translate by [6, 0]**

g. (40 points) Download colorcube.c from CANVAS and add it to Project.



Please rename document to score.doc (example 100.doc)
Warning: if your score is not honest you will get a zero.