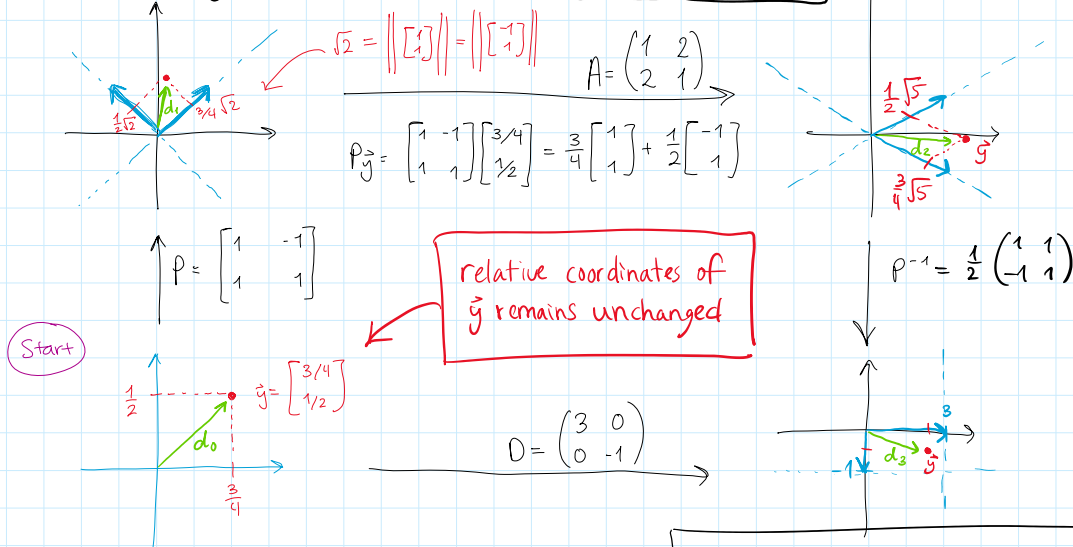


HW1 Fill the drawings in with relative coordinates and distances from origin



$$P_{\vec{y}} = \begin{pmatrix} 1 & -1 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} 3/4 \\ 1/2 \end{pmatrix} = \begin{pmatrix} \frac{3}{4} - \frac{1}{2} \\ \frac{3}{4} + \frac{1}{2} \end{pmatrix} = \begin{pmatrix} \frac{1}{4} \\ \frac{5}{4} \end{pmatrix} \rightarrow$$

$$AP_{\vec{y}} = \begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 1/4 \\ 5/4 \end{pmatrix} = \begin{pmatrix} \frac{1}{4} + \frac{10}{4} \\ \frac{2}{4} + \frac{5}{4} \end{pmatrix} = \begin{pmatrix} \frac{11}{4} \\ \frac{7}{4} \end{pmatrix} \rightarrow$$

$$P^{-1}AP_{\vec{y}} = \frac{1}{2} \begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} 11/4 \\ 7/4 \end{pmatrix} = \frac{1}{2} \begin{pmatrix} 11/4 + 7/4 \\ -11/4 + 7/4 \end{pmatrix} \rightarrow$$

$$= \begin{pmatrix} 9/4 \\ -1/2 \end{pmatrix} = D_{\vec{y}} \rightarrow$$

Distance from origin

$$d_1 = \sqrt{\left(\frac{1}{4}\right)^2 + \left(\frac{5}{4}\right)^2} = \frac{\sqrt{26}}{4}$$

$$d_2 = \sqrt{\left(\frac{11}{4}\right)^2 + \left(\frac{7}{4}\right)^2} = \frac{\sqrt{170}}{4}$$

$$d_3 = \sqrt{\left(\frac{9}{4}\right)^2 + \left(-\frac{1}{2}\right)^2} = \frac{\sqrt{82}}{4}$$

$$d_0 = \sqrt{\left(\frac{3}{4}\right)^2 + \left(\frac{1}{2}\right)^2} = \frac{\sqrt{13}}{4}$$

Conceptual Sketch

