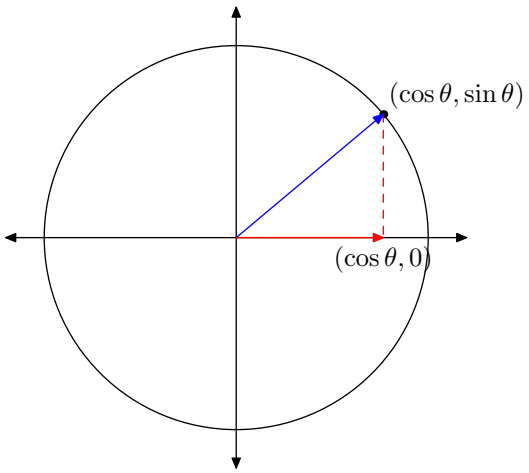
Here is a picture of the projection of $\mathbf{b} = (\cos\theta, \sin\theta)$ onto $\mathbf{a} = (1, 0)$.



It is pretty clear that the projection of $\mathbf{b}$ onto $\mathbf{a}$ is $\mathbf{p} = (\cos\theta, 0)$. Now, let's get the same result analytically.

$$\begin{aligned}
\mathbf{p} &= \frac{\mathbf{a}^T\mathbf{b}}{\mathbf{a}^T\mathbf{a}}\mathbf{a} \\
&= \frac{\begin{pmatrix}1\\0\end{pmatrix}^T \begin{pmatrix}\cos\theta\\\sin\theta\end{pmatrix}}{\begin{pmatrix}1\\0\end{pmatrix}^T \begin{pmatrix}1\\0\end{pmatrix}} \begin{pmatrix}1\\0\end{pmatrix} \\
&= \frac{\cos\theta}{1}\begin{pmatrix}1\\0\end{pmatrix} \\
&= \begin{pmatrix}\cos\theta\\0\end{pmatrix}
\end{aligned}$$