Orthogonal Projections

The Idea for this Section: Given a vector $\mathbf{y}$ in and a subspace W in $\mathbb{R}^n$, there is a vector $\hat{\mathbf{y}}$ in W such that...

1. $\hat{\mathbf{y}}$ is the unique vector in W for which $\mathbf{y} - \hat{\mathbf{y}}$ is orthogonal to W, and
2. $\hat{\mathbf{y}}$ is the unique vector in W closest to $\mathbf{y}$.

Example 27.1:

Theorem 27.2:

Example 27.3:

Property of Projections:

Theorem 27.4:

Example 27.5:

Example 27.6:

Theorem 27.7