

1. (p. 211 #14) Let V be the vector space of all polynomials, and define on it the inner product $(p(t), q(t)) = \int_0^1 p(t)q(t)dt$. Find the cosine of the angle between the following pairs of vectors in V .

(a) $p(t) = t$, $q(t) = t - 1$. (b) $p(t) = t$, $q(t) = t$. (c) $p(t) = 1$, $q(t) = 2t + 3$.

2. (p 224 #10) Use the Gram-Schmidt process to transform the basis

$\{\mathbf{u}_1 = (1, 1, 1), \mathbf{u}_2 = (0, 1, 1), \mathbf{u}_3 = (1, 2, 3)\}$ for \mathbf{R}_3 into an orthonormal basis for \mathbf{R}_3 .