

1. State the Parallelogram Law.
2. Prove the Cauchy-Schwarz inequality: $|\langle u, v \rangle| \leq \|u\| \|v\|$.
3. Find the angle between $p(t) = 3t - 1$ and $q(t) = 3t - 2$ with respect to the inner product $\langle p, q \rangle = \int_0^1 p(t)q(t) dt$.