

Solution (#887) Either use Proposition 3.185 with $\mathbf{a} = \mathbf{c} = \mathbf{u}$ and $\mathbf{b} = \mathbf{d} = \mathbf{v}$ or take a more first-principles approach to show

$$(u_1^2 + u_2^2 + u_3^2)(v_1^2 + v_2^2 + v_3^2) - (u_1v_1 + u_2v_2 + u_3v_3)^2 = \sum_{i < j} (u_iv_j - u_jv_i)^2.$$