

① Find a basis for ~~$\langle x^3+1, x^2+1 \rangle$~~ $\langle x^3+1, 1+x^2, x^2(1-x) \rangle = V$, subspace of P_3 .

② Find a basis for $\{p \in P_2 \mid \int_0^1 p(x^2) dx = 0\}$.

③ Find a basis for $\{A \in M_{22} \mid A = A^t\}$.

④ Find a basis for $\{A \in M_{22} \mid A = -A^t\}$.

⑤ Find a basis for $\langle \cos(x + \frac{\pi}{4}), \sin(x - \frac{\pi}{3}), \cos(x + \frac{\pi}{3}), \sin(\frac{\pi}{6} - x) \rangle$, subspace of $\mathbb{C}^{\mathbb{R}}$.

Hint: $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$
 $\sin(\alpha + \beta) = \cos \alpha \sin \beta + \sin \alpha \cos \beta$