1) Find inner product of given vectors.

$\mathbf{R}^3$ $\quad x = (2, -3, 1), \quad y = (1, 5, -6)$

2) Inner product of polynomials can be calculated as

$p(x),\ q(x) \in P_n(\mathbf{R})$

$$< p(x), q(x) > = \int_0^1 p(x) \cdot q(x)\, dx$$

Calculate inner product of given polynomials;

$P_2(\mathbf{R})$ $\quad p(x) = 3x^2 + 2x + 5 \ , \ q(x) = x + 1$

3) Calculate inner product of given vectors

M_{2x2} $\quad A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}, B = \begin{pmatrix} 2 & 0 \\ 1 & -3 \end{pmatrix}$

4) Find angle between two vectors in M_{2x2} space.

M_{2x2} $\quad A = \begin{pmatrix} 1 & 2 \\ 0 & -1 \end{pmatrix}, B = \begin{pmatrix} -1 & 0 \\ 2 & 3 \end{pmatrix}$

5) Show that given vectors are orthogonal and find orthonormal basis vectors.

$\mathbf{R}^3$ $\quad x_1 = (1, 0, 3) \ , \ x_2 = (0, 2, 0) \ , \ x_3 = (-3, 0, 1)$

6) Find orhonormal basis vectors in R^3 from given vectors in R^3

$E = \{ (1, 1, 1), (1, 0, 2), (1, 2, 3) \}$