Property-2. If K_1 & K_2 are valid kernels, then $K_1 \cdot K_2$ is also a valid kernel (proved in class).

Property 3 :- If K_1 is a valid kernel, then $(K_1)^d$ is a valid kernel $\forall d \in N$.

(Proved in part 1).

Using property 1, 3 we can say that for ~~any i ∈ {0, n-1}~~ any $i \in \{0, 1, \dots n-1\}$.

$a_i K(x, x')^i$ is a valid kernel.

Hence summation over all $i \in N$, $i < n$

$\sum_{i=0}^{i<n} a_i K(x, x')^i$ is also a valid kernel

Hence proved. $q(K(x, x'))$ is also a valid kernel

[Q.2.2]

My kernel = $K(x, y) = (1 + x^T y)^4$

This gives an error < 7000 which is desired. [Plot attached on the next page]