Quiz (8) MCS 471 Jan Verschelde Friday 21 October 2005

NAME : Type of Calculator :

1. The graph of $\sin(x)$ for $x \in [0,1]$ resembles a line.

   Set up the system of normal equations to compute the best linear fit to $\sin(x)$, using the points $x_0 = 0$, $x_1 = 1/2$ and $x_2 = 1$.

   Do not solve this system. You may leave $\sin(x_0)$, $\sin(x_1)$, $\sin(x_2)$ unevaluated.

2. As $(x^m)^n = x^{mn} = (x^n)^m$, we have the analogue identity for Chebyshev polynomials:

$$T_n(T_m(x)) = T_{mn}(x) = T_m(T_n(x)).$$

   Use $T_n(x) = \cos(n \arccos(x))$, to show $T_n(T_m(x)) = T_{nm}(x)$.