1056-11-10 **Hung-ping Tsao*** (hptsao@hotmail.com), 1151 Highland Drive, Novato, CA 94949. *Triangular arrays induced from trigonometric functions.*

Using cos2nA=2cosnAcosnA-1 and cos(2n-1)A=2cosnAcos(n-1)A-cosA, we can obtain the polynomial expressions in cosA for cosmA. Let c(m,k) denote the triangular array formed by the coefficients in question. Then we can use c(2n-1,2k)=c(2n,2k-1)=0, c(4n-2,0)=-1, c(4n,0)=1, c(1,1)=1, c(2,2)=2, c(2n+1,k)=2c(2n,k-1)-c(2n-1,k) and c(2n+2,2k)=2c(2n+1,2k-1)-c(2n,2k) to generate the entire array. The triangular array induced from sin(2n-1)A is the same as that induced from cos(2n-1)A except the signs for even n. Let s(2n,k) be the triangular array induced from sin2(n+1)A/cosA. Then s(2n,2n-2k) is a linear combination of c(2n,2n-2k) and c(2n-2,2n-2) with the coefficients only involving powers of 4 and the binomial coefficient C(2n-k-1,k-2). Furthermore, we have s(2n,2k)=s(2n-2,2k)-2(n-k+1)s(2n,2k-2)/k. By writing tan(2n-1)A and tan2nA into rational functions of tanA and considering only nonzero entries, we obtain arrays t, u, v and w from numerators and denominators so that t and u are the same for odd n and differ in signs, where u(n,k)=C(2n-1,2k-2) for even n-k and u(n,k)=-C(2n-1,2k-2) for odd n-k. We also have v(n,k)=C(2n,2k-1) for even k, v(n,k)=-C(2n,2k-1) for odd k, w(n,k)=C(2n,2k) for even k and w(n,k)=-C(2n,2k) for odd k. c and u are also related. (Received May 27, 2009)