1. Write a computer function that will perform the close-the-loop analysis. Your program should solve the standard case as well as the two special cases, that is, when $\mathbf{S}_7$ and $\mathbf{S}_1$ are parallel and when $\mathbf{S}_7$ and $\mathbf{S}_1$ are collinear. The C language prototype for your subroutine may be written as

void close_loop (double P_tool_6[3], double P_tool_f[3], double S6_f[3], double a67_f[3], double *a71, double *S7, double *S1, double *al71, double *th7, double *gam1).

Test your subroutine by passing in the values for ${}^{6}\mathbf{P}_{\text{tool}}$, ${}^{F}\mathbf{P}_{\text{tool}}$, ${}^{F}\mathbf{S}_{6}$, ${}^{F}\mathbf{a}_{67}$ listed in Section 5.7.