Engineering 1D04
Assignment IV

The following is due at the **BEGINNING** of the tutorial the week of Feb 10 to 14, 2003:

1) A printout of the C code implementation of the pseudo-code from the previous assignment. The C code must have appropriate comments and indentation.
2) The output of the C program including at least 5 good test cases. (See the 1D04 website for information on how to capture program output.)
3) The pseudo-code that the C code is based on. Place your pseudo-code as an appendix at the BACK of the assignment. NOTE: If your pseudo-code had errors in it, you must fix the errors and submit the new pseudo-code with the C code.

NOTE: Please include your tutorial number on every assignment. Remember that the top-page of every assignment is to include the statement :

"This assignment represents my own work"

followed by your signature, and your e-mail address. You need to include this information, or your assignment mark will be ZERO.

Problem

The problem was described in the previous assignment. Write a C program based on the pseudo-code that you developed for the previous assignment.

Numerical application

Compute and output:

i) the angle α of slope *CD* (hill A);
ii) the mass *m* of a skier if his/her potential energy E_{skier} at the point C (the top of the hill A) is known;
iii) the velocity *v* of a skier at the bottom of the run *CD;*
iv) the potential energy E_P of a skier at two arbitrary locations l_1 and l_2 along the slope EF (Figure 3);
v) the distance l_F that a skier can run up the hill B using the kinetic energy he or she gained from sliding down the hill A;
vi) a message stating if both chosen distances (l_1 and l_2) are not attainable by the skier, otherwise, no message.

Include some invalid values when testing your program.

Given values

The potential energy of a skier $E_{skier} = 3.1 \times 10^3$ J at the point C (the top of the hill A), $g = 9.8$ m/s^2, h = 5.0m, $\beta = 18.4°$ and $l_1 = 4.7$ m, $l_2 = 21.1$ m and L=87.9 m