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% David Haberkorn
% 22 Oct 2025
% ES1060 Intro to Engineering Problem Solving
% Lab 6 Problem 1

function [alpha, beta, gamma, Sanity] = haberkorn_david_lab06_problem1(A, B,
C)
% This function finds the interior angles of a triangle given three side
% lengths, given in degrees.
%
% Copy "[alpha, beta, gamma, Sanity] = haberkorn_david_lab06_problem1(A, B,
% C)" into the command window.
%
% Side lengths must be entered from shortest to longest.
%
% 'Sanity' should be equal to 180 degrees. If it is not, DO NOT TRUST THE
% ANSWER

arguments (Input)
A
B
C
end

arguments (Output)
alpha
beta
gamma
Sanity
end

gamma = acosd( (A^2 + B^2 - C^2)/(2*A*B));
alpha = asind(A*sind(gamma)/C);
beta = asind(B*sind(gamma)/C);
Sanity = gamma + alpha + beta;
end

% RESULTS

% [alpha, beta, gamma, Sanity] = haberkorn_david_lab06_problem1(4, 7, 10)
% alpha =
%     18.1949
% beta =
%    33.1229
% gamma =
%   128.6822
% Sanity =
%    180
```

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%  
% [alpha, beta, gamma, Sanity] = haberkorn_david_lab06_problem1(2, 6.1, 7.5)  
% alpha =  
%     12.1214  
% beta =  
%     39.8254  
% gamma =  
%     128.0532  
% Sanity =  
%     180  
%  
% [alpha, beta, gamma, Sanity] = haberkorn_david_lab06_problem1(0.323e5,  
0.548e5, 0.618e5)  
% alpha =  
%     31.4381  
% beta =  
%     62.2398  
% gamma =  
%     86.3220  
% Sanity =  
%     180  
  
Error using haberkorn_david_lab06_problem1 (line 8)  
Invalid argument list. Function requires 3 more input(s).
```

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