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%%

% MAE 206 Final Project
% Ashley Crickard
clear;clc

%%

% assigning o to be from 0 to 90
o = 0:1:90;

% writing x and y equations
x = 34 + 4.*cosd(o) -12.*sind(o);
y = 24 + 4.*sind(o) + 12.*cosd(o);

% putting x and y into one proportion
z = y./x;

% getting the function for alpha
a = atand(z);

% getting the function for Tention as a function of theta

T = (26500.*sind(o) - 800.*cosd(o))./(-24.*cosd(a) +34.* sind(a));


% plotting the equation
gcf = figure(1);plot(o,T);
% title and labels
title('Tention vs Theta');
ylabel('Tention, lbs');
xlabel('Theta, Degress');

%ploting the force diagram around H
Hy = 850 + T.*sind(a);
Hx = T.*cosd(a);
H = sqrt(Hx.^2+Hy.^2);
GCF = figure(2);plot(o,H);
% Title and Labels
title('Force at H vs Theta');
ylabel('Force, lbs');
xlabel('Theta, degrees');
% finding the max  and min force for H
[HMAX, HMAXpos] = max(H);
fprintf('The max force at H has a magnitude of %f lbs at %f degrees.\n'...
    , HMAX, HMAXpos-1 );
[HMIN, HMINpos] = min(H);
fprintf('The min force at H has a magnitude of %f lbs at %f degrees.\n'...
    , HMIN, HMINpos-1 );

% finding the max T to use to find the cylinder needed to be used at AB
TMAX = max(T);
fprintf('The max force at T has a magnitude of %f lbs\n', TMAX);
```