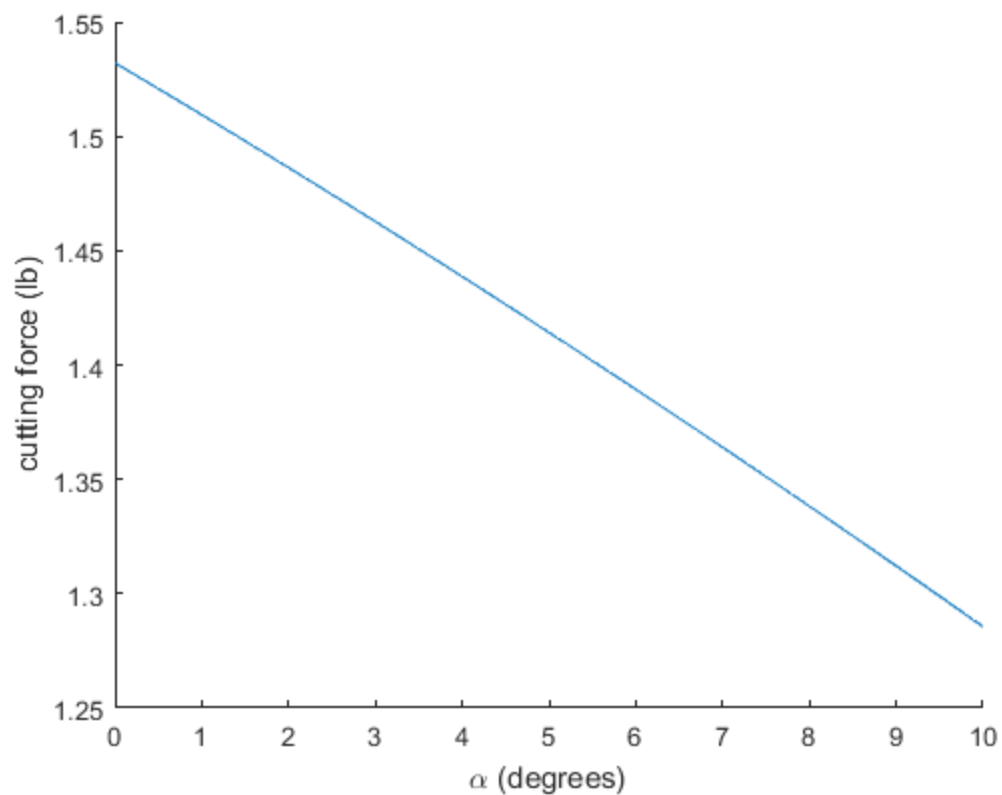```
clear
close all
clc

alpha = 0:0.1:10;
Angle_Insert = 80;
shear_force = 1; %constant just for comparison
deg_per_rad = 180/pi;

beta = 90-alpha-Angle_Insert;
phi = 45+alpha/2-beta/2;
cutting_force = (shear_force.*cosd(beta-alpha)./cosd(phi+beta-alpha));

figure
hold on
plot(alpha,cutting_force)
hold off
xlabel('\alpha (degrees)');
ylabel('cutting force (lb)');
```



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