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M = input("Enter the Mach number");
G = input("Enter γ");
%%Isentropic Flow%%
Pressure_Ratio = ( 1 + (G-1)/2 * M^2)^(-G/(
(G-1)));
Temp_Ratio = (1 + (G-1)/2 * M^2)^(-1);
Density_Ratio = (1 + (G-1)/2 * M^2)^(-1/(
(G-1)));
Area_Ratio = (1/M)*((2/(G+1)*(1 + (G-1)/2
* M^2)))^((G+1)/(2*(G-1)));
MFP = sqrt(G)*M*( 1 + (G-1)/2 *
M^2)^(-1*(G+1)/(2*(G-1)));

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%%Normal Shock%%
NM2 = sqrt((M^2+2/(G-1))/(2*G/(
(G-1)*M^2-1))
NPt21 = (((G+1)/2*M^2)/(1+(G-1)/
2*M^2))^(G/(G-1)) * (2*G/(G+1)*M^2 -
(G-1)/(G+1))^((-1)/(G-1))
NP21 = (2*G*M^2/(G+1))-((G-1)/(G+1))
NT21 = ((2*G/(G-1)*M^2-1)*(1+(G-1)/

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$$2*M^2))/((G+1)^2*M^2/(2*(G-1)))$$

$$ND21 = ((G+1)*M^2)/((G-1)*M^2+2)$$

%%Rayleigh Flow%%

$$\text{Phi} = (M^2*(1+(G-1)/2*M^2))/((1+G*M^2)^2)$$

$$RT = (G+1)^2*M^2/(1+G*M^2)^2$$

$$RP = (G+1)/(1+G*M^2)$$

$$RTt = ((2*(G+1)*M^2)/((1+G*M^2)^2))*(1 + (G-1)/2 * M^2)$$

$$RPt = ((G+1)/(1+G*M^2))*((2/(G+1))*(1+(G-1)/2*M^2))^(G/(G-1))$$

%%Fanno Flow%%

$$F\text{Long_Term} = ((1-M^2)/(G*M^2))+((G+1)/(2*G))*(\log(M^2/((2/(G+1))*(1+(G-1)/2*M^2))))$$

$$FI = (1+G*M^2)/(M*\text{sqrt}(2*(G+1)*(1+(G-1)/2*M^2)))$$

$$FT = ((2/(G+1))*(1+(G-1)/2*M^2))^{(-1)}$$

$$FP = (1/(M*\text{sqrt}((2/(G+1))*(1+(G-1)/$$

$$2 \cdot M^2))))$$