

Handout #30

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function M=framms(dx,dy,p,A)

%FRAMMS Formation of 6x6 plane frame element consistent
%      mass matrix
% M=framms(dx,dy,p,A)
% M = 6x6 consistent mass matrix
% dx = directed projection of the member on the X-axis
% dy = directed projection of the member on the Y-axis
% p = mass density (rho)
% A = cross-sectional area

M=zeros(6);
L = sqrt(dx^2 + dy^2);
constant=(p*A*L)/420;
M(1,1)=140;
M(1,4)=70;
M(2,2)=156;
M(2,3)=22*L;
M(2,5)=54;
M(2,6)=-13*L;
M(3,3)=4*L^2;
M(3,5)=13*L;
M(3,6)=-3*L^2;
M(4,4)=M(1,1);
M(5,5)=M(2,2);
M(5,6)=-M(2,3);
M(6,6)=M(3,3);
%Form the lower symmetric part
d=zeros(1,6);
M1=M;
M1=stodg(M,d);
M1=M1';
M=(M+M1)*constant;
%Transformation matrix
T=zeros(6);
T(1,1)=dx;
T(1,2)=dy;
T(2,1)=-dy;
T(2,2)=dx;
T(3,3)=L;
T(4,4)=dx;
T(4,5)=dy;
T(5,4)=-dy;
T(5,5)=dx;
T(6,6)=L;
T=T/L;
M=T'*M*T;
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