% Define the values of X

X = [-1, 0, 1, 2, 3];

% Define the probabilities with K

% P(X) = [0.1, K, 0.2, 2\*K, 0.3]

syms K

P = [0.1, K, 0.2, 2\*K, 0.3];

% i. Find K using the sum of probabilities = 1

eq = sum(P) == 1;

K\_val = solve(eq, K);

K\_val = double(K\_val);

fprintf('i. Value of K = %.4f\n', K\_val);

% Now substitute K to get actual probabilities

P\_val = double(subs(P, K, K\_val));

% ii. Compute E(X)

EX = sum(X .\* P\_val);

fprintf('ii. E(X) = %.4f\n', EX);

% iii. Compute E(X^2)

EX2 = sum((X.^2) .\* P\_val);

fprintf('iii. E(X^2) = %.4f\n', EX2);

% iv. Compute Var(X) = E(X^2) - (E(X))^2

VarX = EX2 - EX^2;

fprintf('iv. Var(X) = %.4f\n', VarX);