clear;

close;

clc;

M = 4;

a = 1;

T = 1;

S = [(-3/2)\*a\*sqrt(T), (-1/2)\*a\*sqrt(T), (3/2)\*a\*sqrt(T), (1/2)\*a\*sqrt(T)];

x\_grid = linspace(-2, 2, 9);

y\_grid = linspace(-0.5, 0.5, 5);

for x = x\_grid

plot2d([x x], [-0.5 0.5], style = 3);

end

for y = y\_grid

plot2d([-2 2], [y y], style = 3);

end

plot2d(S, [0,0,0,0], -10, "000");

xlabel("phi1(t)");

title("M-ary QAM Signal Constellation");

disp("M-ary QAM Representation of Transmitted Symbols");

disp("Location of message points: " + S);

disp("Transmitted symbol 00 | 01 | 11 | 10");

disp("Received symbol 00 | 01 | 11 | 10");

disp("Decision intervals for received symbols");

disp("Interval on phi1(t): x < -a\*sqrt(T) | -a\*sqrt(T) < x < 0 | 0 < x < a\*sqrt(T) | x > a\*sqrt(T)");