(1)

function Product = matrix\_trans(B)

a = [2 0 0 0; 0 1 0 0; 0 0 1 0; 0 0 0 1]; %right

b = [1 0 0 0; 0 1 0 0; 0 0 1/2 0; 0 0 0 1]; %left

c = [1 0 1 0; 0 1 0 0; 0 0 1 0; 0 0 0 1]; %left

d = [0 0 0 1; 0 1 0 0; 0 0 1 0; 1 0 0 0]; %right

e = [1 -1 0 0; 0 1 0 0; 0 -1 1 0; 0 -1 0 1]; %left

f = [1 0 0 0; 0 1 0 0; 0 0 1 1; 0 0 0 0]; %right

g = [0 0 0 0; 0 1 0 0; 0 0 1 0; 0 0 0 1]; %right

Product = e \* c \* b \* B \* a \* d \* f \* g;

% or otherwise

A = e \* c \* b, C = a \* d \* f \* g;

Product = A \* B \* C;

end

(2)

syms x1 x2 x3

eq1 = 2 \* x1 + x2 + x3 - 4;

eq2 = x1 + 3 \* x2 + 2 \* x3 - 6;

eq3 = x1 + 2 \* x2 + 2 \* x3 - 5;

[x1, x2, x3] = solve(eq1, eq2, eq3, x1, x2, x3);

A = [2, 1, 1; 1, 3, 2; 1, 2, 2];

x = [x1, x2, x3];

A \* x'

Finding that the result is [4, 6, 5] which is correct.

(3)

A = [2 -3 1 3; 4 1 -1 5; 1 1 0 6; -7 0 0 9];

norm(A, 1)

norm(A, 2)

norm(A, inf)

norm(A, 'fro')

% Verify 3.3

x = [1, 2, 3, 4];

norm(x, inf), norm(x, 2)

norm(x, 2), 2 \* norm(x, inf)

norm(A, inf), 2 \* norm(A, 2)

norm(A, 2), 2 \* norm(A, inf)

(4)

A = [1 2; 2 2; 2 1];

[U, S, V] = svd(A)

The result is as follows:

U =

-0.5145 0.7071 0.4851

-0.6860 0 -0.7276

-0.5145 -0.7071 0.4851

S =

4.1231 0

0 1.0000

0 0

V =

-0.7071 -0.7071

-0.7071 0.7071

(5)

x = -1:0.05:1;

y1 = exp(x);

y2 = 3 \* exp(-10 \* x .^ 2);

plot(x, y1)

hold on

plot(x, y2)

xlabel('x on [-1,1]'), ylabel('value of function')

title('plot for two exp functions')

legend('exp(x)', '3\*exp(-10x^2)')

