clear

clc

%Task 1

clear

figure(1)

disp('---Task 1---')

syms pi

al = pi/3;

A = [cos(al) -sin(al)

sin(al) cos(al)];

x = [2

2];

xn = A\*x

hold on, grid on

quiver(0,0,x(1),x(2),0,'r')

quiver(0,0,xn(1),xn(2),0,'b')

line([-3 3],[0 0],'linewidth',2)

line([0 0],[-3 3],'linewidth',2)

legend('Первоначальный вектор','Образ вектора')

text(3,0.5,'axis x"')

text(-1,3,'axis y"')

%Task 2

clear

disp('---Task 2---')

syms pi

al = pi/3;

A = [cos(al) -sin(al)

sin(al) cos(al)];

L = -5;

C1 = L\*A;

C2 = [L\*cos(al) -L\*sin(al)

L\*sin(al) L\*cos(al)];

C1 == C2

disp('Свойства проверены')

%Task 3

clear

figure(2)

disp('---Task 3---')

format rat

e1 = [3

0

1];

e2 = [1

2

-1];

e3 = [2

-2

0];

A = zeros(3);

A(:,1)=e1;

A(:,2)=e2;

A(:,3)=e3;

det(A)~=0

format rat

e = [A(:,1)];

for k= 2:1:3

n=0;

for i=1:1:k-1

n=n+dot(A(:,k),e(:,i))/(norm(e(:,i)))^2\*e(:,i);

end

e=[e A(:,k)-n];

end

e

grid on, hold on, axis equal

quiver3(0,0,0,e1(1),e1(2),e1(3),0,'b')

quiver3(0,0,0,e2(1),e2(2),e2(3),0,'b')

quiver3(0,0,0,e3(1),e3(2),e3(3),0,'b')

axis equal

quiver3(0,0,0,e(1),e(2),e(3),0,'r')

quiver3(0,0,0,e(4),e(5),e(6),0,'r')

quiver3(0,0,0,e(7),e(8),e(9),0,'r')

xlabel('x')

ylabel('y')

%Task 4

clear

disp('---Task 4---')

A = [-2 2 -3

1 2 1

2 -1 2];

a1 = [0;1;2];

a2 = [-2;-1;1];

a3 = [2;1;2];

T1 = [a1 a2 a3];

T = inv(T1);

A = T1\*A\*T

format rat

A