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Linear

```
% Part a
a1=[3,1,2;-1,1,1];
a2=[1;2;1];
% a1.*a2;
% Not possible - array sizes don't match

% Part b
b1=[2,1,0,1;1,0,1,1];
b2=[1;2;1;4];
% b1.*b2;
% Not possible - array sizes don't match

% Part c
c1=[1;2;1];
c2=[3,1,2;-1,1,1];
% c1.*c2;
% Not possible - array sizes don't match

% Part d
d1=[1,0,0;0,1,0;0,0,1];
d2=[1;2;1];
d1.*d2;
```

Transpose

```
e=[2,-1;1,4;3,2]';
f=[2+j,-4,6;7,8-5j,3;7-j,-7,6+3j]';
```

Inverse

```
g=[3,-2;-8,-5];
g_inv=inv(g);
h=[2-j,3+j, 1;4,6-8j,0;-1-j,1,4];
h_inv=inv(h);
```

Equality

```
h*h_inv;
% This gives the identity matrix:
```

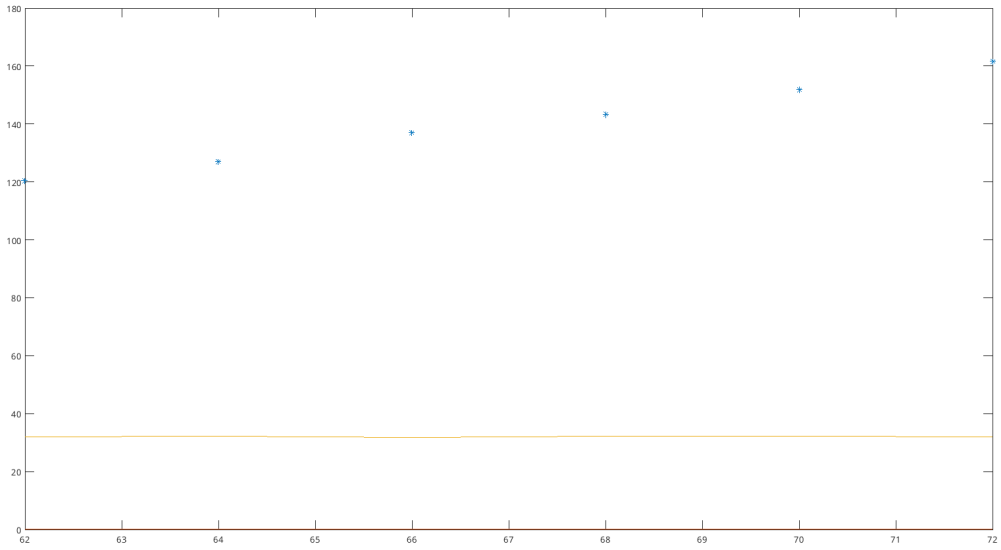
```
%{
1 0 0
0 1 0
0 0 1
%}
```

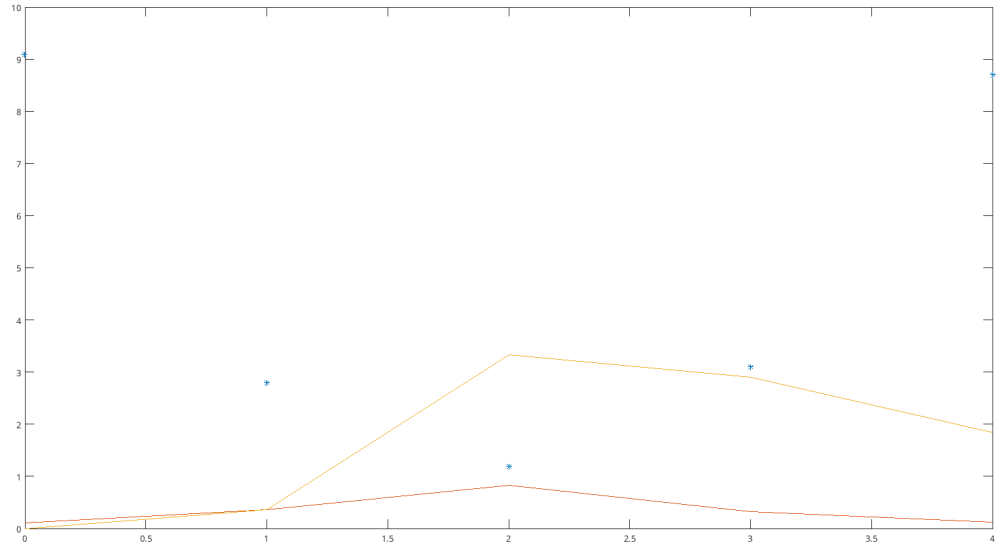
Solve

```
syms x y z
eqn1=x-3*y+2*z==1;
eqn2=2*x+y+11*z==-5;
eqn3=-3*x+y-z==4;
eqns=[eqn1 eqn2 eqn3];
solve(eqns);
% x=-21/3  y=-12/13  z=-1/13

eqn1=2*x+y+z==1;
eqn2=x+2*y+z==2;
eqn3=-x+4*y==-1;
eqns=[eqn1 eqn2 eqn3];
solve(eqns);
% x=-5/3  y=-2/3  z=5
```

Linear Least Squares

```
x1=[62,64,66,68,70,72];
y1=[120.5,127.2,137.1,143.3,151.8,161.7];
X1=[ones(length(x1),1),(x1.')];
B1=X1./y1.';
ID1=X1.*B1;
figure(1)
plot(x1,y1,'*',x1,ID1,'-');

x2=[0,1,2,3,4];
y2=[9.1,2.8,1.2,3.1,8.7];
X2=[ones(length(x2),1),(x2.')];
B2=X2./y2.';
ID2=X2.*B2;
figure(2)
plot(x2,y2,'*',x2,ID2,'-');
```





Published with MATLAB® R2023b