```
[x1,x2,x3,x4,v] = decoding
```

```
x1 = 200×1
         0
    0.3095
    0.6017
    0.8700
    1.1084
    1.3120
    1.4769
    1.6000
    1.6798
    1.7156
      ⋮
x2 = 200×1
    1.0000
    0.9920
    0.9683
    0.9291
    0.8751
    0.8072
    0.7264
    0.6340
    0.5316
    0.4206
      ⋮
x3 = 200×1
    1.0000
    1.0631
    1.1260
    1.1883
    1.2499
    1.3105
    1.3699
    1.4278
    1.4840
    1.5382
      ⋮
x4 = 200×1
   -1.0000
   -0.9920
   -0.9683
   -0.9291
   -0.8751
   -0.8072
   -0.7264
   -0.6340
   -0.5316
   -0.4206
      ⋮
v = 200×1
    0.3117
    0.2474
    0.3290
    0.3241
    0.2344
    0.3286
    0.3016
    0.2095
    0.1935
```

```
    0.1489
     ⋮
```

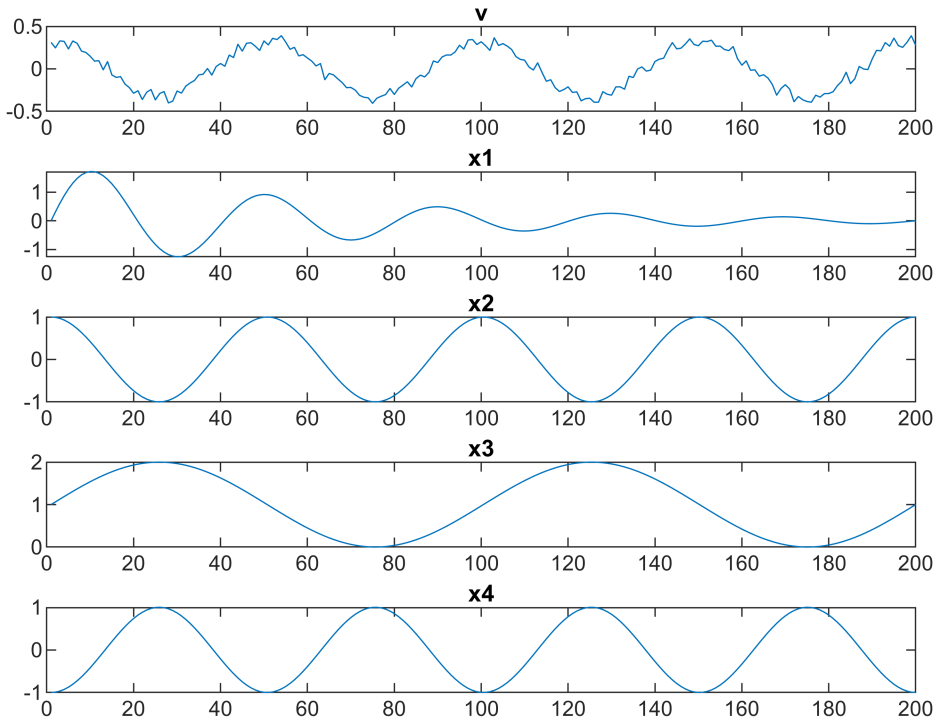
```
%a) Plotting vectors v, x1, x2, x3, x4
figure;
subplot(5,1,1);
plot(v);
title('v');

subplot(5,1,2);
plot(x1);
title('x1');

subplot(5,1,3);
plot(x2);
title('x2');

subplot(5,1,4);
plot(x3);
title('x3');

subplot(5,1,5);
plot(x4);
title('x4');
```



```
%Visually, it is obvious that the input signal x2 was used to generate v

%b) Calculating angle of v with each of the four signals xk.

X = [x1 x2 x3 x4];
theta = zeros(1,4);
for k = 1:4
    theta(k) = acosd(dot(v, X(:,k)) / (norm(v)*norm(X(:,k))));
end

[theta_min, k_min] = min(theta);
disp(theta);
```

```
   69.6662   10.9556   90.1134  169.0444
```

```
fprintf('Smallest angle: x^(%d) with %.4f degrees\n', k_min, theta_min);
```

```
Smallest angle: x^(2) with 10.9556 degrees
```

```
%Signal x2 makes the smallest angle with v, which confirms my conclusion
%that x2 was used to generate v.
```