

```
% Question 1
```

```
function [sol] = func(m, n, s)
    [j, k] = meshgrid(1:m, 1:n);
    jk = [j(:), k(:)]';
    po = inv(s)*jk;
    P0 = round(po);
    res = (po == P0);
    res1 = find(res(1,:)==1);
    res2 = find(res(2,:)==1);
    index = intersect(res1, res2);
    sol = jk(:, index);
end
```

```
% [OUTPUT]
```

```
>> m = 4; n = 6; s = [2 0; 0 2];
>> func(m, n, s)
```

```
ans =
```

```
    2    2    2    4    4    4
    2    4    6    2    4    6
```

```
>> m = 5; n = 6; s = [1 1; 1 -1];
>> func(m, n, s)
```

```
ans =
```

```
    1    1    1    2    2    2    3    3    3    4    4    4    5    5    5
    1    3    5    2    4    6    1    3    5    2    4    6    1    3    5
```

```
% Question 2
```

```
clear
f = inline('x.^2 .* exp(-3.*x.^2) + (x/40).^2', 'x');
h = 1e-7;
x = -10:1e-4:10;
y_f = f(x);
y_df = (f(x+h)-f(x-h))/(2*h);
y_ddf = (f(x+h)+f(x-h)-2*f(x))/(h^2);
```

```
figure
```

```
plot(x,y_f, x,y_df, x,y_ddf)
legend("f(x)", "f'(x)", "f''(x)")
```

```
disp(['f_max' max(y_f); 'f'_max' max(y_df); 'f''_max' max(y_ddf)])
```

```
    "f_max"        "0.12283"
    "f'_max"       "0.33936"
    "f''_max"      "2.0012"
```

