IALP 2011 – Octave TP3-solutions

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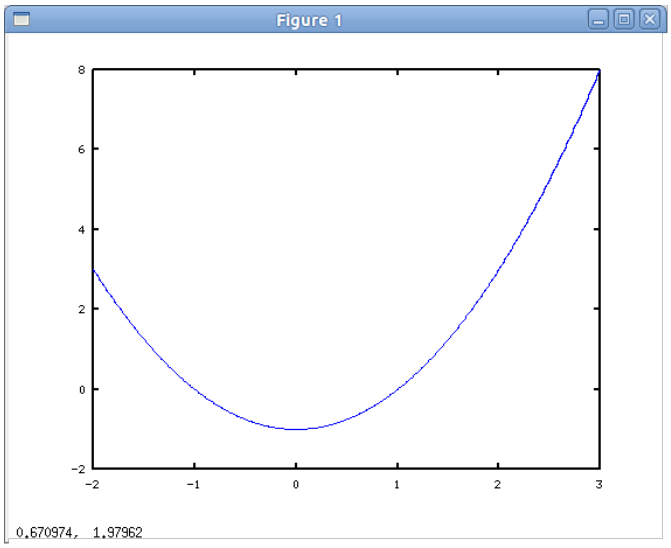
MIEET 1º ano

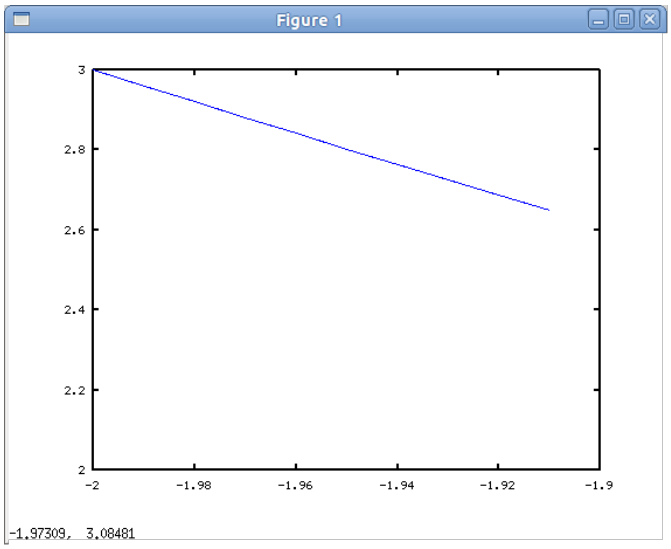
Exercise 1:

```
x = linspace(-2, 3, 501);
y = x.^2 - 1;
plot(x, y);
```



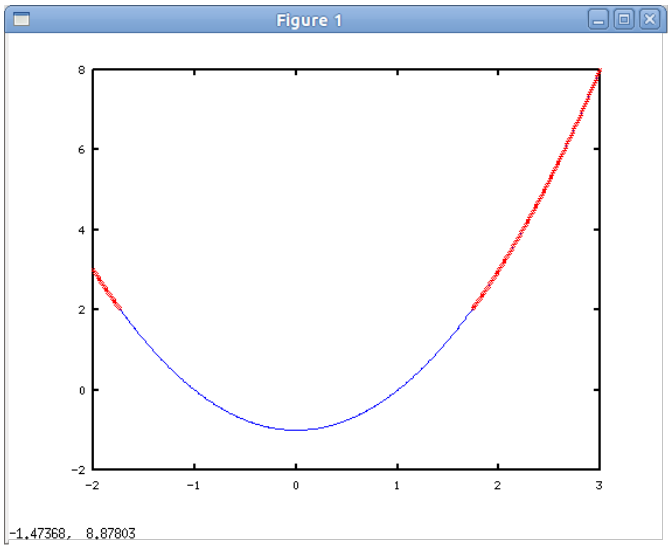
Exercise 2:

```
x = linspace(-2, 3, 501);
y = x.^2 - 1;
plot(x(1:10), y(1:10));
```



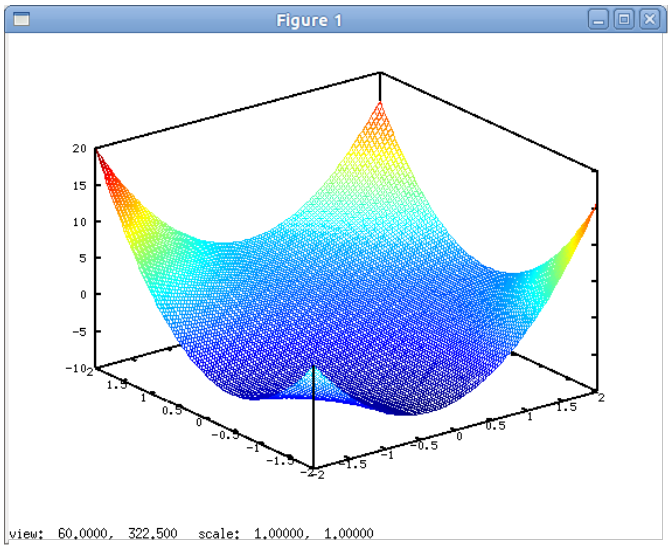
b)

```
x = linspace(-2, 3, 501);
y = x.^2 - 1;
ind = find(y>2);
plot(x, y, 'b-', x(ind), y(ind), 'rx');
```



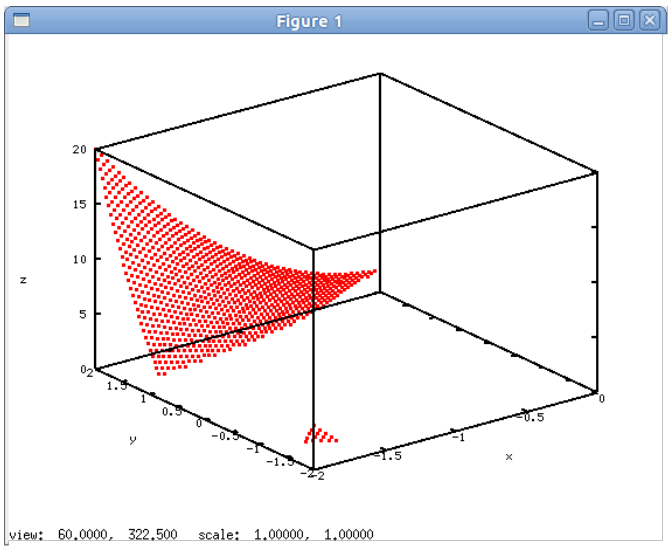
Exercise 3:

```
[x, y] = meshgrid(linspace(-2, 2, 101), linspace(-2, 2, 101));
z = (x.^2).*(y.^2) - x.*y + x + 2*y -2;
mesh(x, y, z);
```



Exercise 4:

```
[x, y] = meshgrid(linspace(-2, 2, 101), linspace(-2, 2, 101));
z = (x.^2).*(y.^2) - x.*y + x + 2*y -2;
ind = find((z>2) & (x<0));
plot3(x(ind), y(ind), z(ind), 'ro');
xlabel('x');
ylabel('y');
zlabel('z');
```



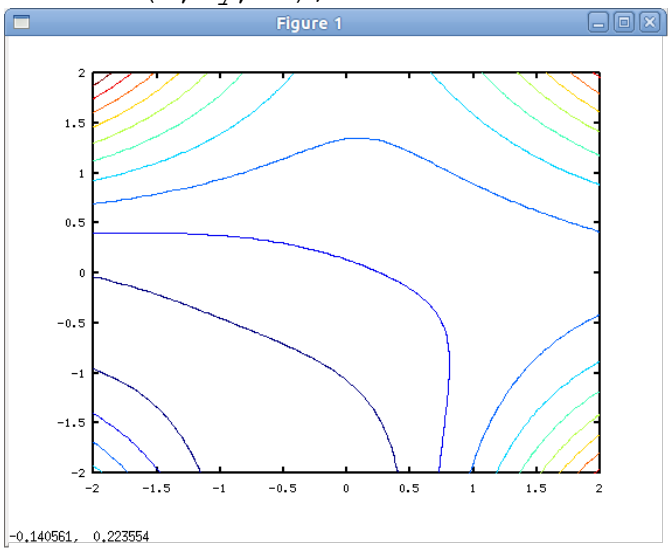
Useful information (after execution of program):

```
octave:2> whos
Variables in the current scope:

   Attr Name        Size                     Bytes  Class
   ==== ====        ====                     =====  =====
        ind         955x1                     7640  double
        x           101x101                  81608  double
        y           101x101                  81608  double
        z           101x101                  81608  double

Total is 31558 elements using 252464 bytes
```

Note: the variables `x`, `y`, `z` are **two**-dimensional arrays. `x` for example is the x part of a set of 101 by 101 coordinates (x, y). For every coordinate we have a function value z(x, y). `ind` contains the indexes of all the coordinates for which x<0 and z>2.

Exercise 5:

```
[x, y] = meshgrid(linspace(-2, 2, 101), linspace(-2, 2, 101));
z = (x.^2).*(y.^2) - x.*y + x + 2*y -2;
contour(x, y, z);
```



Exercise 6:

```
x = linspace(-4*pi, 4*pi, 500);
y = (x.*x-1).*sin(x);
[maxx, maxi] = max(y);
plot(x, y, 'b-');
hold on;
plot(x(maxi), y(maxi), 'ro');
```