

### 5.1.2 Plot of a Function

In many situations there is a need to plot a given function. This can be done in MATLAB by using the `plot` or the `fplot` command. The use of the `plot` command is explained below. The `fplot` command is explained in detail in the next section.

In order to plot a function  $y = f(x)$  with the `plot` command, the user needs to first create a vector of values of  $x$  for the domain over which the function will be plotted. Then a vector  $y$  is created with the corresponding values of  $f(x)$  by using element-by-element calculations (see Chapter 3). Once the two vectors are defined, they can be used in the `plot` command.

As an example, the `plot` command is used to plot the function  $y = 3.5^{-0.5x} \cos(6x)$  for  $-2 < x < 4$ . A program that plots this function is shown in the following script file.

```
% A script file that creates a plot of
% the function: 3.5.^(-0.5*x).*cos(6*x)
x=[-2:0.01:4];
y=3.5.^(-0.5*x).*cos(6*x);
plot(x,y)
```

Create vector  $x$  with the domain of the function.

Create vector  $y$  with the function value at each  $x$ .

Plot  $y$  as a function of  $x$ .

Once the script file is executed, the plot is created in the Figure Window, as shown in Figure 5-4. Since the plot is made up of segments of straight lines that connect the points, to obtain an accurate plot of a function, the spacing between the elements of the vector  $x$  must be appropriate. Smaller spacing is needed for a

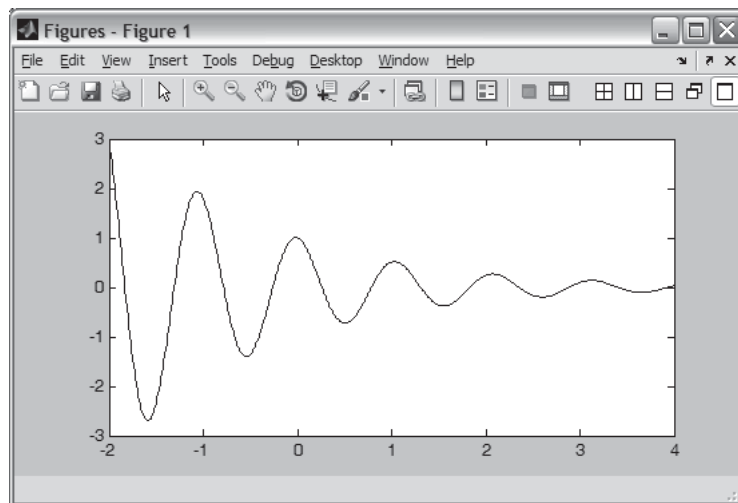


Figure 5-4: The Figure Window with a plot of the function  $y = 3.5^{-0.5x} \cos(6x)$ .