the future, we'll often use declarations with a function. For example,

```matlab
function [area] = circle_area (radius)
    
    % A MATLAB function is like a script but it starts with a declaration with a function.
    % The area is: 
    disp('The area is: ', area)
```

In MATLAB, we can use `syms` to declare variables that are not assigned particular values (that is, we don't say `x = 1`), we have to declare them as "symbolic". (Note: in Mathematica, the distinction is made internally and is not declared.) We'll do that here using `syms`.

The value of a variable. For example,

```matlab
syms x
```

is used for output of a message (in the form of text enclosed in single quotes) or which might be distracting. (`disp` is more appropriate). `disp` is used to get a value from the user for a variable. The general form is:

```matlab
variable_name = input('message to be displayed')
```

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```matlab
variable_name = input('message to be displayed')
```

For example,

```matlab
>> syms x
```

will pop up a window with a plot of $\sin(x)$.

To make a plot of a symbolic function, we can use `ezplot`.

```matlab
>> syms x
>> ezplot(sin(x),[0,pi])
```

In MATLAB, we can use `ezplot` to make a plot of a symbolic function, we can use `ezplot`.

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>> ezplot(sin(x),[0,pi])
```
In class we contrasted these numerical approximations to the derivative of the function \( f(x) \):

\[
\frac{f(x + \Delta x) - f(x)}{\Delta x}
\]

1. Numerical Derivatives and Round-off Errors using MATLAB

> deriv_test

```
>> x = logspace(-10,1,200);
>> loglog(x,x.^2.*exp(-x))
```

In class we considered three numerical approximations to the derivative of \( f(x) \):

\[
\frac{f(x + \Delta x) - f(x)}{\Delta x}
\]

1. Numerical Derivatives and Round-off Errors using MATLAB

> deriv_test

```
>> x = logspace(-10,1,200);
>> loglog(x,x.^2.*exp(-x))
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