Some Basic MATLAB used in Math 221

Command Line Structure
If a command is terminated with a semi-colon (with a ";") then its output is not echoed.

```
>> help <command>  Provide help about <command>.
>> helpdesk       Open MATLAB's HelpDesk.
```

Standard Operators and Functions

```
+, -, *, /, ^  Addition, subtraction, multiplication, division, and exponentiation.
abs(x)        The absolute value |x| of x.
sqrt(x)       The square root √x of x.
sin(x), cos(x), tan(x),
sec(x), csc(x), cot(x)  The standard circular trig functions; the angle x is in radians.
```

Constants

```
pi           π
```

General Purpose Commands

```
>> % <junk>         This is a comment. It will be ignored by MATLAB.
>> clear all       Clear MATLAB’s memory.
>> close all       Close all of MATLAB’s figure windows.
>> a = <value>     Assigns <value> to a.
>> x = <expression> Assigns <expression> to x.
>> f = inline(‘<expression in x>’)  Identifies the function f(x) as <expression in x>.
>> format long     Sets the number of digits to 14.
>> format short    Sets the number of digits to 4.
>> figure(n)       Open Figure Window n.
>> ezplot(f(x),[a,b])  Graph f(x) for x ∈ [a, b].
>> ezplot(f(x),[a,b,c,d],figure(n))  Graph f(x) for x ∈ [a, b] and y ∈ [c, d] in Figure No. n.
>> hold on ... hold off  Start and stop of figure window graphics control.
>> quit            Terminate this session of MATLAB.
```

Symbolic Toolbox Commands

```
>> syms a b c       Declare the symbolic quantities a, b, and c.
>> expand(a*(b+c))  Expand a(b + c).
>> factor(a*b+a*c)  Factor a * b + a * c.
>> simplify((x^2-1)/(x-1))  Simplify (x^2 – 1)/(x – 1).
>> subs(E,x,y)      Substitute y for x in the expression E.
>> pretty(E)       Write the expression E in algebraic form.
>> solve(x^2-1,x)   Solve the equation x^2 – 1 = 0 for x.
>> diff(f(x),x)     Find D_x f(x).
>> int(f(x),x)      Find ∫ f(x) dx.
>> int(f(x),x,a,b)  Find ∫_a^b f(x) dx.
```

Control Structure
The syntax of a for loop is:

```
>> for <index>=<m>:<n>
    <yada>;
    <yada>;
    <yada>;
end;
```