Some Basic MATLAB used in Math 221

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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 \(\sqrt{x}\) 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 is \(\pi\)

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 \(x \in [a, b]\).
>> ezplot(f(x),[a,b,c,d],figure(n)) Graph \(f(x)\) for \(x \in [a, b]\) and \(y \in [c, d]\) 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 \(a \ast b + a \ast c\).
>> 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 \(\int f(x) \, dx\).
>> int(f(x),x,a,b)      Find \(\int_{x=a}^{b} f(x) \, dx\).

Control Structure
The syntax of a for loop is:

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

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