

You should get into the habit of configuring your computer to show file extensions. To do this, open any folder in Windows. Somewhere below the main color bar, you should be able to see a **View** label. Click on this, then check the box that says **File name extensions**. This will make your life easier in the long run.

For this assignment, you should print out your scripts. Note that while you are given specific test cases to run, your scripts should work for any valid set of inputs. Paste the output from the requested sample runs at the end of your script file. Be sure to put comment symbols (%) in front of these lines that you paste in.

Remember that to display the result of a calculation, you can just leave off the ; at the end of the command. You can also just type the variable name at the command line.

```
>> a = 1;
>> a
a =
    1
```

- 1) (2 pts) Suppose you know that x is the cosine of some angle. Write a script that will ask the user to input x and compute the principal angle corresponding to x . The angle should be output in degrees. Test your program using $x = \frac{\sqrt{2}}{2}$.
- 2) (3 pts) Write a script that will ask the user to input the x and y coordinates of a point in the x - y plane and compute the polar coordinates of the point. Test your script using the values $x = -1, y = -\sqrt{3}$. You should review the first problem of HW 1 and the list of functions in Section 3 of the MATLAB Linear Algebra notes.
- 3) (4 pts) An important formula in discrete mathematics is the sum of the first n natural numbers:

$$\sum_{i=1}^n i = 1 + 2 + 3 + 4 + \cdots + n = \frac{n(n+1)}{2}. \quad (1)$$

Fortunately, MATLAB makes it easy to verify (which is not the same as prove) that this formula is true. Write a script that does the following:

- a) Asks the user to input a value for n .
- b) Generates the vector $\mathbf{x} = [1 \ 2 \ 3 \ 4 \ \dots \ n]$. Hint: Use an array index for this.
- c) Uses the built-in `sum` (see `help sum`) function to sum the elements of \mathbf{x} .
- d) Computes the fraction on the right-hand side of Equation (1).
- e) Displays the values from parts c) and d).

Run your script for $n = 5$ and $n = 22$.