1. **Arithmetic:** At the MATLAB command prompt, >>, type each given command then press **Enter**

```
>> 21 + 19                    >> -5 - 7
>> 10 * -8                    >> 3 * 4 * 6 / 12
>> 5 ^ 3                      >> 10 ^ -2 / 10
```

2. **Variables:** *to clear the command window* type >> clc

```
>> a = 40                     >> a + 12
>> a - 80                     >> a / 4
>> a \ 4                      >> b = 125;
```

Can you see the effect of the semi-colon ; ? It prevents the output from being displayed on the screen. The output values are however kept in the memory, try the following:

```
>> b                          >> a + b
>> a - b                      >> a * b / 25
>> a \ b                      >> a / b
```

Try the following to see what will work and what won't:

```
>> cu2011 = -64               >> CU2011 = 46
>> variable 1 = 58            >> 3rdVariable = 99
>> resistance_2 = 10          >> cu2011 - CU2011
```

If you have forgotten what you called some variables, the command **who** will list the names for you. For more information on each variable, type **whos**

3. **Special Variables:**

```
>> ans                        >> pi
>> 1/inf                      >> 1/0
>> 0/0                        >> nan
>> eps                        >> var 1
```

4. **Basic Math Functions:**

```
>> sin(a)                     >> sqrt(b / 5)
>> tan(b / a)                 >> acos(1 / 2)
>> tand(45)                   >> cosd(60)
>> sind(90)                   >> acosd(1 / 2)
>> asind(sqrt(3) / 2)         >> atand(1 / sqrt(3))
>> log(exp(5))                >> log10(1e-8)
```

5. **Number Format:**

```
>> x = exp(1.234)                    >> y = 123456789
>> y2 = 1234567898                   >> Z1 = 126.0009
>> Z2 = 0.0009                       >> Z3 = 0.009
>> format short e
>> x                                 >> y
>> y2                                >> Z1
>> format short g
>> x                                 >> y
>> y2                                >> Z1
>> Z2                                >> Z3
>> format long
>> x                                 >> y
>> y2                                >> Z1
```

To see the largest and smallest allowable numbers in MATLAB type:

```
>> realmax                           >> realmin
```

6. **Double Precision (64 bit) arithmetic:**

   The largest representable number in MATLAB's double precision format has an exponent corresponding to the bits: 11111111110 (i.e. 10 ones and a zero). Convert this exponent from its binary representation to a base 10 number. *(Ans:* $1 \times 2^{10} + 1 \times 2^9 + 1 \times 2^8 + \ldots + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$*).*

   This task should prove rather tedious even with copy + paste commands. In fact would you even dare to attempt a similar conversion (from binary to base 10) for the largest possible double precision mantissa, which contains a string of 52 ones?

   If you were indeed brave enough to attempt these calculations, you should now be in a position to compute the largest representable double precision numbers in MATLAB.

7. **Vectors:**

   Once we cover vectors later, all such computations, as those in item 6 above, should be quite routine and can be accomplished with relative ease!

8. **Help:**

   MATLAB provides a help system, but like most computing help systems, you have to know *something* before the help info actually helps. *Type* ***help sin***, ***help realmax***, ***help log10***, ***help plot*** *etc. These are easy to understand, but many things you might want to ask about have no info, e.g.* ***help vector***. Once you have encountered a concept, like **format**, there is no need to remember all the alternatives. Just type **help format** when you need to know!

9. **But WHY??**

   Before finishing, type >> **why** Enter it again – repeat it several times.

10. Exit MATLAB with the command >> **exit** or >> **quit**.