

## User Information

To run a Python script in a cell, place the cursor anywhere inside the cell, left mouse click, and then press **CTRL SHIFT**

To hide the output from a cell, place the cursor in the margin to the left of the output and double click with the left mouse button.

## Indices - Multiplication 01

$$a^x \times a^y = a^{x+y}$$

## About this Python script

The script will help you gain practice at:

using the Sympy module to represent mathematical symbols
representing quantities multiplied together
representing quantities raised to powers
changing letters representing output
printing output in Python and using Pretty Print
calculating the numerical value of an expression

The script multiplies out a quantity 'a' by itself five times.

The result is then put into a variable 'b' .

'b' is subsequently printed out in standard Python and using Pretty Print.

In [14]:

```
from sympy import *      # import everything from the module 'sympy'

a = Symbol('a')         # defining 'a' as a symbol

b=a*a*a*a*a*a          # '**' in Python means multiply (x)

print (b)               # output in Python   '**' means to the power of
print()                 # line space
pprint(b)               # output in Pretty Print - in standard mathematical format
```

a\*\*6

6

a



### **Task #1 running the script**

Run the Python script in the above cell by placing the cursor anywhere inside the cell. Left mouse click. Then press **CTRL SHIFT**.

Now hide the output from the cell, by placing the cursor in the margin to the left of the output and double click with the left hand mouse button.

### **Task #2 altering the number of 'a's**

You should now appreciate that a line of 'a's multiplied together can be represented by a single 'a' with a number to the upper right equal to the number of 'a's.

Now alter the value of 'b' by multiplying by 'a' more times. Just place the cursor at the last 'a' and type. You choose how many '\*a's to include.

Remember, to run the script again, you place the cursor anywhere in the cell, left mouse click, and press **CTRL SHIFT**.

### **Task #3 changing the output letter 'b'**

Change 'b' to whatever letter you like, except 'a' .

But remember every 'b' in the script must be changed to the new letter.

If the script gives an error when you run it, then you'll know you have missed something.

### **Task #4 obtaining a numerical value**

You can easily obtain a value for your expression of 'a's multiplied together.

To do this you must stop the line of code: `a = Symbol('a')` and replace it with the value of 'a' you want. Say `a = 3` .

To stop the line of code `'a = Symbol(...'` executing just place a hashtag # in front of it.

Then write below on the next line `'a = 3'`

The resulting number as output will be printed twice.

### **Task #5 save your amended Python script to your hard-drive and over-write the previous version**

In [ ]: