Maths Operators

Python supports most common maths operations similar to that of other languages. The table below lists maths operators supported by python.

Syntax	Math	Operation Name
`a+b`	a+b	addition
`a-b`	a-b	subtraction
a*b	a * b	multiplication
a/b	a\div b	division (see note below)
a//b	a//b	floor division (e.g. 5//2=2)
a%b	a%b	modulo
-a	-a	negation
<	a < b	less- than
>	a > b	greater- than
<=	a <= b	less- than- equal
>=	a >= b	greater- than- equal
abs(a)	`| a |`	absolute value
a**b	a**b	exponent
math.sqrt(a)	sqrt a	square root

> **Note**: In order to use the math.sqrt() function, you must explicitly tell Python that you want it to load the math module. To do that, write `import math` at the top of your file.

```
# Sample Code
# Say Cheese
x = 34 - 23 # A comment.
y = "!!! Say" # Another one.
z = 3.45
if z == 3.45 or y == "Say":
```

```
    x = x + 1
    y = y + " Cheese !!!" # String concat.
print("x = " + str(x))
print(y)
print("Is x > z", x > z ," and y is", y, "and x= ", x)
print("x - z =", x - z)
print("-"*10)
# print(y - x)
```

```
x = 12
!!! Say Cheese !!!
Is x > z True  and y is !!! Say Cheese !!! and x=  12
x - z = 8.55
----------
```

```
print("x = " + str(x) + " and z = " + str(z))
print("x =", x, "and z =", z)
print("x % z =", x % z )
print("x >= z", x >= z)
```

```
x = 12 and z = 3.45
x = 12 and z = 3.45
x % z = 1.6499999999999995
x >= z True
```

```
mass_kg = int(input("What is your mass in kilograms?" ))
mass_stone = mass_kg * 2.2 / 14
print("You weigh ", mass_stone, " stone.")
```

```
What is your mass in kilograms?75
You weigh  11.785714285714286  stone.
```

Order of Operations

Python uses the standard order of operations as taught in Algebra and Geometry classes at high school or secondary school. That is, mathematical expressions are evaluated in the following order (memorized by many as PEMDAS or BODMAS), which is also applied to parentheticals.

(Note that operations which share a table row are performed from left to right. That is, a division to the left of a multiplication, with no parentheses between them, is performed before the multiplication simply because it is to the left.)

Name	Syntax	Description	PEMDAS Mnemonic
Parentheses	(...)	Before operating on anything else, Python must evaluate all parentheticals starting at the innermost level. (This includes functions.)	Please
Exponents	**	As an exponent is simply short multiplication or division, it should be evaluated before them.	Excuse
Multiplication and Division	* / // %	Again, multiplication is rapid addition and must, therefore, happen first.	My Dear
Addition and Subtraction	+ -	They should happen independent to one another and finally operated among eachother	Aunt Sally

Formatting output

round()

```
print (round(3.14159265, 2))
```

```
3.14
```

Exercises

- Ask the user the radius of a circle and return the area of the circle
- Ask the user to specify the number of sides on a polygon and find the number of diagonals within the polygon.
- Take the lengths of two sides of a right-angle triangle from the user and apply the Pythagorean Theorem to find the hypotenuse.
- Use Python to calculate 2^{2^{2^{2}}}
- Use Python to calculate (3+2)^{4}{7}
- Use Python to calculate 111111111111111111+22222222222222222, but in one line of code with at most 15 characters. (Hint: each of those numbers is 20 digits long, so you have to find some other way to input those numbers)
- Exactly one of the following expressions evaluates to "cat"; the other evaluates to "dog". Trace the logic to determine which one is which, then check your answer using Python.

> NOTE: Copied from **https://en.wikibooks.org/wiki/Python_Programming <https://en.wikibooks.org/wiki/Python_Programming>**