Math and Type Conversion Predefined Functions

Mathematical Predefined Functions

For each of the examples below, type the small programs and record the result. Fill in the function definitions using your observations. Note that the math library must be imported.

1. **math.sqrt** (number) - returns the square root of a number
   - the parameter is an integer or float

   math.sqrt () function

   ex. 1 **print (math.sqrt** (6084)) *78*

   ex. 2 **print (math.sqrt** (684.8)) *26.1686835740738*

   ex. 3 **print (math.sqrt** (-9)) *math domain error - cannot find the square root of a negative*

2. **abs** (number) - return the absolute value of a number
   - the parameter is an integer or float

   ex. 1 **print** (abs (-45)) *45*

   ex. 2 **print** (abs (45)) *45*

   ex. 3 **print (**abs (-45.8)) *45.8*

3. **math.sin** (angle)) - returns the sine of an angle in radians
   - the parameter is a float

   ex. **print (math.sin** (0)) *0.0*

   print (math.sin (1.57079632679)) *1.0*

4. **math.cos** (angle) - returns the cosine of an angle in degrees
   - the parameter is a float

   ex. **print (math.cos** (3.14159265359)) *-1.0*

   print (math.cos (1.57079632679)) *4.8965888601467475e*-12

5. **math.pi** - Returns the constant pi
   - There are no parameters in this function

   print (math.pi) *3.141592653589793*

Predefined Functions Used To Convert Data Types

The following functions are used to convert data types. Type the example programs and use the test data provided to determine how the functions work. Fill in the function definitions using your observations.

1. **Convert From Float Data**

a) **math.ceil** (float) - the number is round up to the next highest integer

b) **math.floor** (float) - the number is round up to the next lowest integer

c) **round** (float) - the number is rounded to the nearest integer

ex. *Type the following program and input the following values for num: 5.7, 5.5, 5.3, -6.7 Record each result on the line beside the code.*

num = **float** (**input** ("Enter a float"))

print (**math.ceil** (num)) *6 6 6 -6*

print (**math.floor** (num)) *5 5 5 -7*

print (**round** (num)) *6 6 5 -7*

2. **Convert From String Data**

a) **int (string)** - converts a string value to an integer value
- will return an error message if the value cannot be converted to an integer

b) **float (string)** - converts a string value to a float value
- will return an error message if the value cannot be converted to a float

ex. **print (int** ("9")) *9*

print (float ("9.7")) *9.7*

3. **Convert From Integer Data**

a) **float (int)** - converts an integer value to a real value

b) **str (int)** - converts an integer value to a string value

4. **Check If Data Contains Only Numeric Values:**

str.isdigit - Returns a value of true if string contains only digits and false otherwise

ex. *Type the following program and input the following values for num: 57, -55, 5.3, 123 King, Record each result on the line under the code.*

```
num = input ("Enter value")
if str.isdigit (num):
    print ("Your input is a positive integer")
else :
    print ("Your input is not a positive integer")
# 57 results in "Your input is a positive integer"
# -55, 5.3, 123 King  results in "Your input is a not positive integer"
```