Assignment 3

Math Stuff

Python is full of great math functions and operations you can use. Below is a list of common ones.
For some of the math functions in python you need to **import** the `math` **library** before you use them.

Example:

For finding the **square root** of a number you would do the following:

```
import math
answer = math.sqrt(4)
print(answer)
```

Commonly used Math operations in python:

Syntax	Math Operation Name
a%b	modulo
-a	Negatives
abs(a)	absolute value
a**b	exponent
math.sqrt(a)	square root
math.pi	3.1415… correct value of pi
a*b	multiplication
a/b	division
a+b	add
a-b	Subtract

Check out: https://docs.python.org/3/library/math.html for more

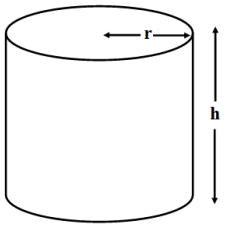
Remember to watch your **brackets** and **order of operations.**

Exercise#1

Write a python program that will accept the radius and height of a cylinder from the user and output its volume.

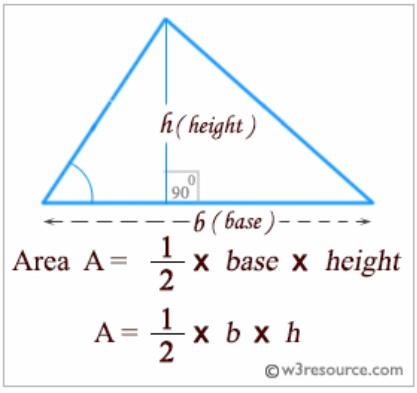
Use: `math.pi` as your value for pi
Use: `a**b` to get your exponent (r^2)

$$V = \pi r^2 h$$



Exercise#2

Write a Python program that will accept the base and height of a triangle from the user and computes the of the triangle.



Sample solution on next page.

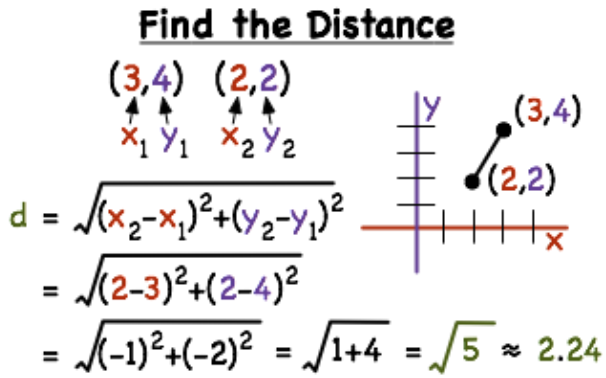
Sample Solution to Exercise#2

```
b = int(input("Input the base : "))
h = int(input("Input the height : "))
area = (b*h)/2
print("area = ", area)
```

Exercise#3

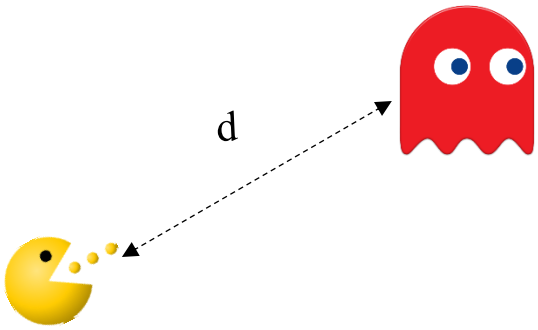
A computer screen is commonly mapped out in software using an (x,y) coordinate system. Keeping track of how close to objects on a screen are is also a common.

In mathematics you can find the distance between two points in the following way:



The Formula you need to know is:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



Write a Python program to compute the distance between the points (x_1, y_1) and (x_2, y_2). Have the user give you two points… and your program will output the distance between them.

You must use:
`math.sqrt`

Sample solution on next page. Try first then peek…

Sample solution:

```
import math

p1 = [4, 0]
p2 = [6, 6]
distance = math.sqrt( ((p1[0]-p2[0])**2)+((p1[1]-p2[1])**2) )

print(distance)
```

Exercise#4

Use python to solve a math problem based on what you are doing in math class right now! Maybe something in your math class that would impress your teacher!

Bonus:

Use an animation/drawing to spice up your program and the user experience.
Pg. 72 (turtle graphics)

Super Bonus:

Animate Exercise#3 with turtle.