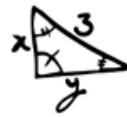


Maths

Explanation

Python can perform several mathematical functions, but these are only available when the data is treated as either an **integer** (a whole number) or a **floating-point** (a number with a decimal place). If data is stored as a string, even if it only contains numeric characters, Python is unable to perform calculations with it (see page **Error! Bookmark not defined.** for a fuller explanation).



Example Code

Please note: In order to use some of the mathematical functions (`math.sqrt(num)` and `math.pi`) you will need to import the maths library at the start of your program. You do this by typing `import math` as the first line of your program.

```
print(round(num, 2))
```

Displays a number rounded to two decimal places.

To the power of (e.g. 10^2 is 10^{**2}).

math.sqrt(num)

The square root of a number, but you must have the line `import math` at the top of your program for this to work.

```
num=float(input("Enter number: "))
```

Allows numbers with a decimal point dividing the integer and fraction part.

math.pi

Gives you pi (π) to 15 decimal places, but you must have the line `import math` at the top of your program for this to work.

x // y

Whole number division (e.g. $15//2$ gives the answer 7).

x % y

Finds the remainder (e.g. $15\%2$ gives the answer 1).



Challenges

027

Ask the user to enter a number with lots of decimal places. Multiply this number by two and display the answer.

030

Display pi (π) to five decimal places.



028

Update program 027 so that it will display the answer to two decimal places.

029

Ask the user to enter an integer that is over 500. Work out the square root of that number and display it to two decimal places.

031

Ask the user to enter the radius of a circle (measurement from the centre point to the edge). Work out the area of the circle ($\pi \times \text{radius}^2$).

032

Ask for the radius and the depth of a cylinder and work out the total volume (circle area * depth) rounded to three decimal places.

033

Ask the user to enter two numbers. Use whole number division to divide the first number by the second and also work out the remainder and display the answer in a user-friendly way (e.g. if they enter 7 and 2 display "7 divided by 2 is 3 with 1 remaining").



034

Display the following message:

- 1) Square
- 2) Triangle

Enter a number:

If the user enters 1, then it should ask them for the length of one of its sides and display the area. If they select 2, it should ask for the base and height of the triangle and display the area. If they type in anything else, it should give them a suitable error message.

You are starting to think like a programmer.

