5 September Notes

Lists in Python

- Ordered, mutable, can hold **mixed data types**.
- Defined with [ ].

```
fruits = ['apple', 'banana', 'cherry']
nums = [10, 20, 30]
mixed = [1, 'hello', 3.14]
print(fruits, nums, mixed)
```

🔹 Accessing & Modifying

```
print(fruits[0])     # first element
fruits[1] = "mango"   # modify
print(fruits)
```

🔹 List Methods

```
numbers = [3, 1, 4, 2]
numbers.append(5)
numbers.insert(1, 10)
numbers.remove(4)
last = numbers.pop()
numbers.sort()
numbers.reverse()
print(numbers)
```

🔹 Looping & Comprehensions

```
for f in fruits:
    print(f)


squares = [x*x for x in range(1,6)]
print(squares)
```

Area Calculations & Arithmetic Operators in Python

🔹 Program 1: Area of Triangle and Circle

Formulae:

- **Triangle** → Area = ½ × base × height
- **Circle** → Area = π × radius^2

✅ Example Code 1:

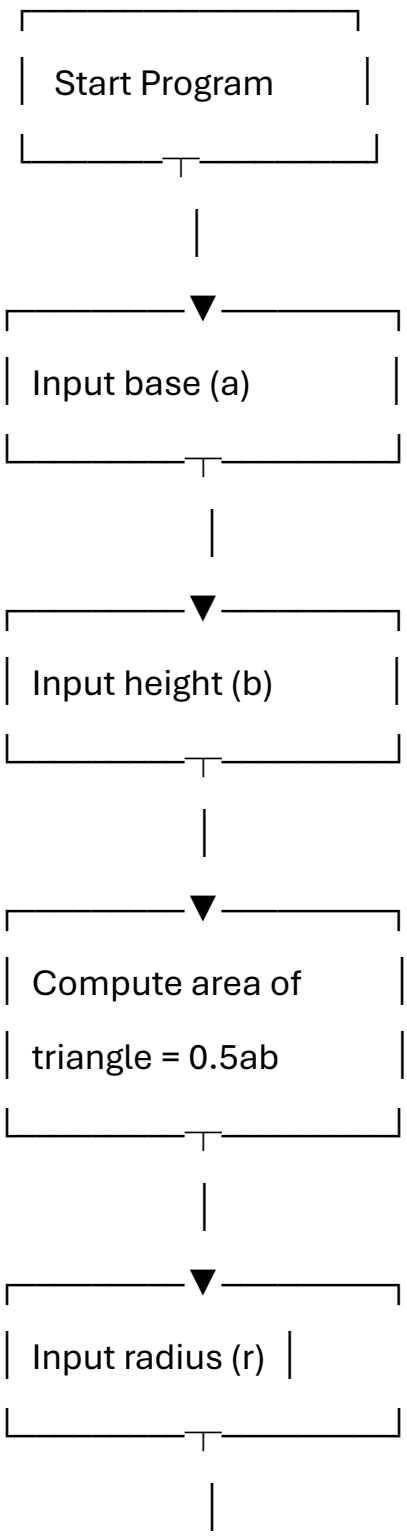
```
a = int(input("Enter base of triangle: "))
b = int(input("Enter height of triangle: "))


print("The Area of Triangle:", 0.5 * a * b)


r = int(input("Enter radius of circle: "))
print("The Area of Circle:", 3.14 * r ** 2)
```

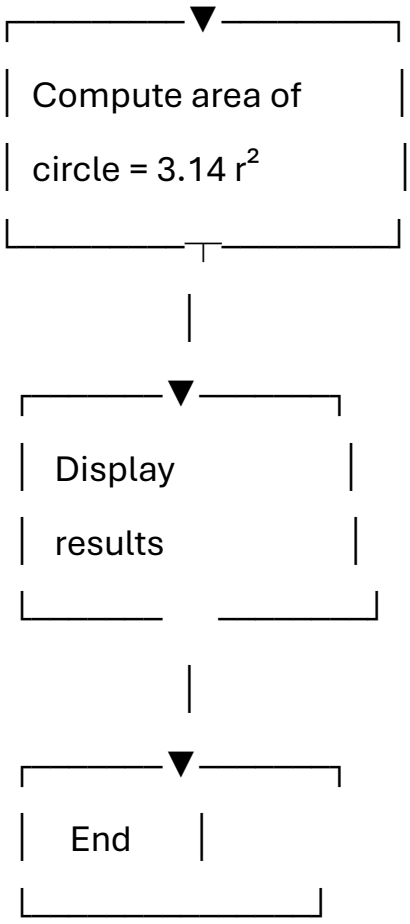
Explanation:

- Take base (a) and height (b) as input.
- Compute area of triangle → 0.5 * a * b.

- Take radius (r) as input.
- Compute area of circle → 3.14 * r ** 2.

🔹 **Flowchart – Area of Triangle & Circle**





🔹 **Program 2: Basic Arithmetic Operations**

✅ **Code:**

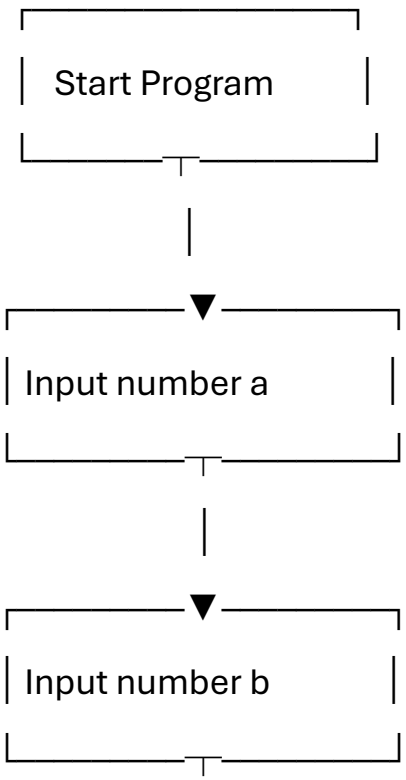
```
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))

print("Addition:", a + b)
print("Subtraction:", a - b)
print("Multiplication:", a * b)
print("Division:", a / b)
print("Floor Division:", a // b)
print("Modulus:", a % b)
```

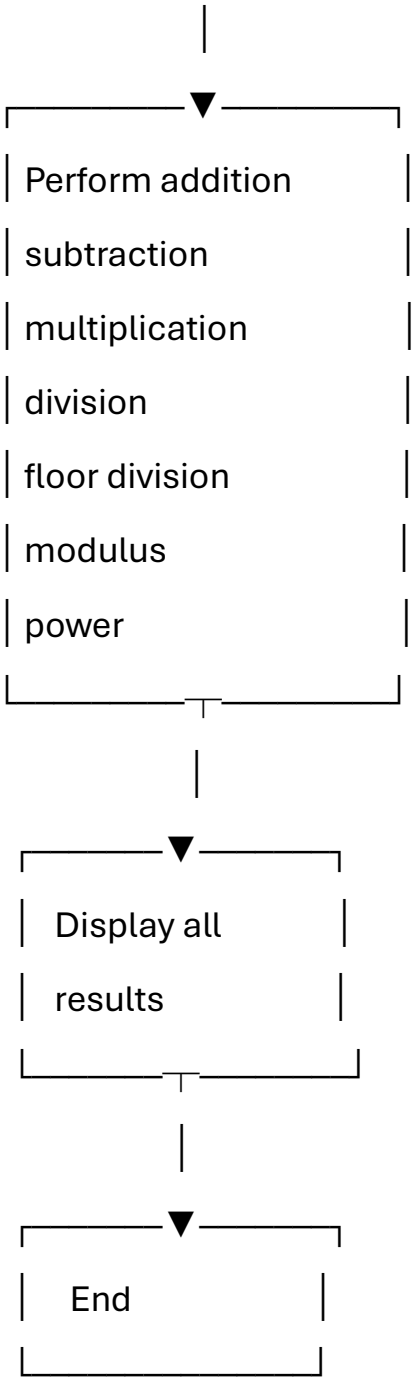
print("Power:", a ** b)

Explanation:

- Take two numbers a and b as input.
- Perform each arithmetic operation:
  - Addition (a + b)
  - Subtraction (a - b)
  - Multiplication (a * b)
  - Division (a / b)
  - Floor Division (a // b)
  - Modulus (a % b)
  - Power (a ** b)
- Print results one by one.

🔹 **Flowchart – Arithmetic Operations**





- **Key Takeaways**

1. **Triangle Area** → 0.5 * base * height
2. **Circle Area** → 3.14 * r ** 2
3. Arithmetic operators cover all basic math (+, -, *, /, %, //, **).
4. Use **flowcharts** to visualize program logic.