import math

import random

# 1. Ceil and Floor

print("Ceil of 4.3:", math.ceil(4.3)) # Rounds up to 5

print("Floor of 4.7:", math.floor(4.7)) # Rounds down to 4

# 2. Trigonometric Functions

print("Cosine of 0:", math.cos(0)) # Cosine of 0 is 1

print("Sine of π/2:", math.sin(math.pi / 2)) # Sine of π/2 is 1

print("Tangent of π/4:", math.tan(math.pi / 4)) # Tangent of π/4 is 1

# 3. Degrees and Radians Conversion

print("Convert 180 degrees to radians:", math.radians(180)) # π radians

print("Convert π radians to degrees:", math.degrees(math.pi)) # 180 degrees

# 4. Exponentials, Logarithms, and Power Functions

print("Exponential of 2:", math.exp(2)) # e^2

print("Base-2 exponential of 3:", math.exp2(3)) # 2^3 = 8

print("Factorial of 5:", math.factorial(5)) # 5! = 120

print("Natural log of e:", math.log(math.e)) # log(e) = 1

print("Log base 10 of 1000:", math.log10(1000)) # log10(1000) = 3

print("2 to the power of 5:", math.pow(2, 5)) # 2^5 = 32

print("Square root of 64:", math.sqrt(64)) # sqrt(64) = 8

# 5. Mathematical Constants

print("Value of e:", math.e) # Euler's number

print("Value of pi:", math.pi) # Pi constant

print("Infinity:", math.inf) # Infinity constant

# 6. Random Module Functions

print("Random number from normal distribution (mean=0, std=1):", random.normalvariate(0, 1))

print("Random integer between 1 and 10:", random.randint(1, 10))

print("Random number from range 0-100, step 5:", random.randrange(0, 100, 5))

print("Random float between 0 and 1:", random.random())

print("Random float between 5 and 10:", random.uniform(5, 10))

Explanation of Functions Used:

Ceil, Floor

math.ceil(x): Rounds up.

math.floor(x): Rounds down.

Trigonometry

math.cos(x), math.sin(x), math.tan(x): Compute cosine, sine, and tangent.

Angle Conversion

math.radians(x): Converts degrees to radians.

math.degrees(x): Converts radians to degrees.

Exponentials, Logarithms, and Power Functions

math.exp(x): Computes

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math.exp2(x): Computes

2

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2

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math.factorial(x): Computes factorial.

math.log(x), math.log10(x): Computes natural log and base-10 log.

math.pow(x, y): Computes

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x

y

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math.sqrt(x): Computes square root.

Math Constants

math.e: Euler's number (~2.718).

math.pi: Pi (~3.14159).

math.inf: Represents infinity.

Random Module

random.normalvariate(mu, sigma): Generates a number according to a normal distribution.

random.randint(a, b): Random integer in the range ab

random.randrange(start, stop, step): Random number within a range with a step.

random.random(): Random float in range 0 and 1

random.uniform(a, b): Random float in the range [a,b].