**Python Math [88 exercises with solution]**

[*An editor is available at the bottom of the page to write and execute the scripts.*]

**1.** Write a Python program to convert degree to radian. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note : The radian is the standard unit of angular measure, used in many areas of mathematics. An angle's measurement in radians is numerically equal to the length of a corresponding arc of a unit circle; one radian is just under 57.3 degrees (when the arc length is equal to the radius).  
*Test Data:*  
Degree : 15  
Expected Result in radians: 0.2619047619047619  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-1.php)

**2.** Write a Python program to convert radian to degree. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)   
*Test Data:*  
Radian : .52  
Expected Result : 29.781818181818185  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-2.php)

**3.** Write a Python program to calculate the area of a trapezoid. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note : A trapezoid is a quadrilateral with two sides parallel. The trapezoid is equivalent to the British definition of the trapezium. An isosceles trapezoid is a trapezoid in which the base angles are equal so.  
*Test Data:*  
Height : 5  
Base, first value : 5  
Base, second value : 6  
Expected Output: Area is : 27.5  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-3.php)

**4.** Write a Python program to calculate the area of a parallelogram. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note : A parallelogram is a quadrilateral with opposite sides parallel (and therefore opposite angles equal). A quadrilateral with equal sides is called a rhombus, and a parallelogram whose angles are all right angles is called a rectangle.  
*Test Data:*   
Length of base : 5  
Height of parallelogram : 6  
Expected Output: Area is : 30.0  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-4.php)

**5.** Write a Python program to calculate surface volume and area of a cylinder. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)   
Note: A cylinder is one of the most basic curvilinear geometric shapes, the surface formed by the points at a fixed distance from a given straight line, the axis of the cylinder.  
*Test Data:*  
volume : Height (4), Radius(6)  
Expected Output:  
Volume is : 452.57142857142856  
Surface Area is : 377.1428571428571  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-5.php)

**6.** Write a Python program to calculate surface volume and area of a sphere. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: A sphere is a perfectly round geometrical object in three-dimensional space that is the surface of a completely round ball.  
*Test Data:*  
Radius of sphere : .75  
Expected Output :  
Surface Area is : 7.071428571428571  
Volume is : 1.7678571428571428  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-6.php)

**7.** Write a Python program to calculate arc length of an angle. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: In a planar geometry, an angle is the figure formed by two rays, called the sides of the angle, sharing a common endpoint, called the vertex of the angle. Angles formed by two rays lie in a plane, but this plane does not have to be a Euclidean plane.  
*Test Data:*  
Diameter of a circle : 8  
Angle measure : 45  
Expected Output :  
Arc Length is : 3.142857142857143  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-7.php)

**8.** Write a Python program to calculate the area of the sector. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: A circular sector or circle sector, is the portion of a disk enclosed by two radii and an arc, where the smaller area is known as the minor sector and the larger being the major sector.  
*Test Data:*  
Radius of a circle : 4  
Angle measure : 45  
Expected Output:  
Sector Area: 6.285714285714286  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-8.php)

**9.** Write a Python program to calculate the discriminant value. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: The discriminant is the name given to the expression that appears under the square root (radical) sign in the quadratic formula.   
*Test Data:*  
The x value : 4  
The y value : 0  
The z value : -4  
Expected Output:  
Two Solutions. Discriminant value is : 64.0  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-9.php)

**10.** Write a Python program to find the smallest multiple of the first n numbers. Also, display the factors. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
*Test Data:*  
If n = (13)  
Expected Output :  
[13, 12, 11, 10, 9, 8, 7]  
360360   
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-10.php)

**11.** Write a Python program to calculate the difference between the squared sum of first n natural numbers and the sum of squared first n natural numbers.(default value of number=2). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
*Test Data:*  
If sum\_difference(12)  
Expected Output :  
5434   
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-11.php)

**12.** Write a Python program to calculate the sum of all digits of the base to the specified power. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
*Test Data:*  
If power\_base\_sum(2, 100)  
Expected Output :  
115  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-12.php)

**13.** Write a Python program to find out, if the given number is abundant. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: In number theory, an abundant number or excessive number is a number for which the sum of its proper divisors is greater than the number itself. The integer 12 is the first abundant number. Its proper divisors are 1, 2, 3, 4 and 6 for a total of 16.  
*Test Data:*  
If is\_abundant(12)  
If is\_abundant(13)  
Expected Output:  
True  
False  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-13.php)

**14.** Write a Python program to sum all amicable numbers from 1 to specified numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Note: Amicable numbers are two different numbers so related that the sum of the proper divisors of each is equal to the other number. (A proper divisor of a number is a positive factor of that number other than the number itself. For example, the proper divisors of 6 are 1, 2, and 3.)  
*Test Data:*  
If amicable\_numbers\_sum(9999)  
If amicable\_numbers\_sum(999)  
If amicable\_numbers\_sum(99)  
Expected Output:  
31626  
504  
0   
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-14.php)

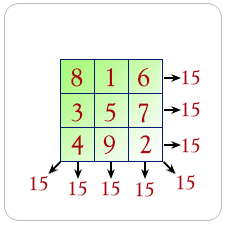
**15.** Write a Python program to returns sum of all divisors of a number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
*Test Data:*  
If number = 8  
If number = 12  
Expected Output:  
7  
16   
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-15.php)

**16.** Write a Python program to print all permutations of a given string (including duplicates). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-16.php)

**17.** Write a Python program to print the first n Lucky Numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Lucky numbers are defined via a sieve as follows.  
Begin with a list of integers starting with 1 :  
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, . . . .  
Now eliminate every second number :  
1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, ...  
The second remaining number is 3, so remove every 3rd number:  
1, 3, 7, 9, 13, 15, 19, 21, 25, ...  
The next remaining number is 7, so remove every 7th number:  
1, 3, 7, 9, 13, 15, 21, 25, ...  
Next, remove every 9th number and so on.   
Finally, the resulting sequence is the lucky numbers.  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-17.php)

**18.** Write a Python program to computing square roots using the Babylonian method. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
Perhaps the first algorithm used for approximating √S is known as the Babylonian method, named after the Babylonians, or "Hero's method", named after the first-century Greek mathematician Hero of Alexandria who gave the first explicit description of the method. It can be derived from (but predates by 16 centuries) Newton's method. The basic idea is that if x is an overestimate to the square root of a non-negative real number S then S / x will be an underestimate and so the average of these two numbers may reasonably be expected to provide a better approximation.  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-18.php)

**19.** Write a Python program to multiply two integers without using the \* operator in python. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-19.php)

**20.** Write a Python program to calculate magic square. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
A magic square is an arrangement of distinct numbers (i.e., each number is used once), usually integers, in a square grid, where the numbers in each row, and in each column, and the numbers in the main and secondary diagonals, all add up to the same number, called the "magic constant." A magic square has the same number of rows as it has columns, and in conventional math notation, "n" stands for the number of rows (and columns) it has. Thus, a magic square always contains n2 numbers, and its size (the number of rows [and columns] it has) is described as being "of order n".  
  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-20.php)

**21.** Write a Python program to print all primes (Sieve\_of\_Eratosthenes) smaller than or equal to a specified number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
In mathematics, the sieve of Eratosthenes, one of a number of prime number sieves, is a simple, ancient algorithm for finding all prime numbers up to any given limit. It does so by iteratively marking as composite (i.e., not prime) the multiples of each prime, starting with the multiples of 2.  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-21.php)

**22.** Write a python program to find the next smallest palindrome of a specified number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-22.php)

**23.** Write a python program to find the next previous palindrome of a specified number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-23.php)

**24.** Write a Python program to convert a float to ratio. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

21/5

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-24.php)

**25.** Write a Python program for nth Catalan Number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
In combinatorial mathematics, the Catalan numbers form a sequence of natural numbers that occur in various counting problems, often involving recursively-defined objects. They are named after the Belgian mathematician Eugène Charles Catalan (1814 –1894).  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-25.php)

**26.** Write a Python program to print number with commas as thousands separators(from right side). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)  
[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-26.php)

**27.** Write a Python program to calculate the distance between two points using latitude and longitude. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input coordinates of two points:

Starting latitude: 23.5

Ending longitude: 67.5

Starting latitude: 25.3

Ending longitude: 69.5

The distance is 284.73km.

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-27.php)

**28.** Write a Python program to calculate the area of regular polygon. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input number of sides: 4

Input the length of a side: 25

The area of the polygon is: 625.0000000000001

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-28.php)

**29.** Write a Python program to calculate wind chill index. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input wind speed in kilometers/hour: 150

Input air temperature in degrees Celsius: 29

The wind chill index is 31

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-29.php)

**30.** Write a Python program to find the roots of a quadratic function. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Quadratic function : (a \* x^2) + b\*x + c

a: 25

b: 64

c: 36

There are 2 roots: -0.834579 and -1.725421

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-30.php)

**31.** Write a Python program to convert a binary number to decimal number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input a binary number: 101011

The decimal value of the number is 43

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-31.php)

**32.** Write a Python program to print a complex number and its real and imaginary parts. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Complex Number: (2+3j)

Complex Number - Real part: 2.0

Complex Number - Imaginary part: 3.0

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-32.php)

**33.** Write a Python program to add, subtract, multiply and division of two complex numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Addition of two complex numbers : (7-4j)

Subtraction of two complex numbers : (1+10j)

Multiplication of two complex numbers : (33-19j)

Division of two complex numbers : (-0.15517241379310348+0.6379310344827587j)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-33.php)

**34.** Write a Python program to get the length and the angle of a complex number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Length of a complex number: 5.0

Complex number Angle: 1.5707963267948966

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-34.php)

**35.** Write a Python program to convert Polar coordinates to rectangular coordinates. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Polar Coordinates: (5.0, 0.9272952180016122)

Polar to rectangular: (-2+2.4492935982947064e-16j)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-35.php)

**36.** Write a Python program to find the maximum and minimum numbers from the specified decimal numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Decimal numbers : 2.45, 2.69, 2.45, 3.45, 2.00, 0.04, 7.25

Expected Output :

Maximum: 7.25

Minimum: 0.04

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-36.php)

**37.** Write a Python program to find the sum of the following decimal numbers and display the numbers in sorted order. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Decimal numbers : 2.45, 2.69, 2.45, 3.45, 2.00, 0.04, 7.25

Expected Output :

Sum: 20.33

Sorted order: [Decimal('0.04'), Decimal('2.00'), Decimal('2.45'), Decimal('2.45'

), Decimal('2.69'), Decimal('3.45'), Decimal('7.25')]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-37.php)

**38.** Write a Python program to get the square root and exponential of a given decimal number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Decimal number : 1.44

Expected Output :

Square root of 1.44 is : 1.2

exponential of 1.44 is : 4.220695816996552825673328929

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-38.php)

**39.** Write a Python program to retrieve the current global context (public properties) for all decimal. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Emax = 999999

Emin = -999999

capitals = 1

prec = 28

rounding = ROUND\_HALF\_EVEN

flags = <class 'decimal.InvalidOperation'>: False

........

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-39.php)

**40.** Write a Python program to round a specified decimal by setting precision (between 1 and 4). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample Number : 0.26598  
Original Number : 0.26598  
Precision- 1 : 0.3  
Precision- 2 : 0.27  
Precision- 3 : 0.266  
Precision- 4 : 0.2660

Expected Output :

Original Number : 0.26598

Precision- 1 : 0.3

Precision- 2 : 0.27

Precision- 3 : 0.266

Precision- 4 : 0.2660

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-40.php)

**41.** Write a Python program to round a specified number upwards towards infinity and down towards negative infinity of precision 4. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

1/17 = 0.05882352941176470588235294118

Precision: 4

Round upwards towards infinity: 0.05883

Round down towards negative infinity: 0.05882

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-41.php)

**42.** Write a Python program to get the local and default precision. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Local precision: 2

22/7 = 3.1

Default precision: 28

22 /7 = 3.142857142857142857142857143

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-42.php)

**43.** Write a Python program to display the fraction instances of the string representation of a number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample data : '0.7', '2.5', '9.32', '7e-1'

Expected Output :

0.7 = 7/10

2.5 = 5/2

9.32 = 233/25

7e-1 = 7/10

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-43.php)

**44.** Write a Python program to create the fraction instances of float numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample numbers: 0.2, 0.7, 6.5, 6.0

Expected Output :

0.2 = 3602879701896397/18014398509481984

0.7 = 3152519739159347/4503599627370496

6.5 = 13/2

6.0 = 6

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-44.php)

**45.** Write a Python program to create the fraction instances of decimal numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample decimal.2' number: Decimal('0), Decimal('0.7'), Decimal('2.5'), Decimal('3.0')

Expected Output :

0.2 = 1/5

0.7 = 7/10

2.5 = 5/2

3.0 = 3

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-45.php)

**46.** Write a Python program to add, subtract, multiply and divide two fractions. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

2/3 + 3/7 = 23/21

2/3 - 3/7 = 5/21

2/3 \* 3/7 = 2/7

2/3 / 3/7 = 14/9

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-46.php)

**47.** Write a Python program to convert a floating point number (PI) to an approximate rational value on the various denominator. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Note: max\_denominator=1000000

Expected Output :

PI = 3.141592653589793

No limit = 3141592653589793/1000000000000000

1 = 3

5 = 16/5

50 = 22/7

90 = 267/85

100 = 311/99

500 = 355/113

1000000 = 3126535/995207

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-47.php)

**48.** Write a Python program to generate random float numbers in a specific numerical range. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

2.036

36.572

36.557

98.051

37.290

77.583

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-48.php)

**49.** Write a Python program to generate random integers in a specific numerical range. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

24 12 72 13 56 80

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-49.php)

**50.** Write a Python program to generate random even integers in a specific numerical range. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

44 50 46 62 94 14

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-50.php)

**51.** Write a Python program to get a single random element from a specified string. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

h

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-51.php)

**52.** Write a Python program to shuffle the following elements randomly. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample elements : [1, 2, 3, 4, 5, 6, 7]

Expected Output :

[2, 1, 7, 5, 3, 4, 6]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-52.php)

**53.** Write a Python program to flip a coin 1000 times and count heads and tails. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Heads: 5073

Tails: 4927

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-53.php)

**54.** Write a Python program to print a random sample of words from the system dictionary. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

cellophane's

matter's

Whiteley's

airdrop's

sulkiest

whisper's

downturns

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-54.php)

**55.** Write a Python program to randomly select an item from a list. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Red

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-55.php)

**56.** Write a Python program to calculate the absolute value of a floating point number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

2.1

0.0

10.1

0.0

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-56.php)

**57.** Write a Python program to calculate the standard deviation of the following data. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Sample Data: [4, 2, 5, 8, 6]

Standard Deviation : 2.23606797749979

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-57.php)

**58.** Write a Python program to print the floating point from mantissa, exponent pair. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Mantissa Exponent Floating point value

-------- -------- --------------------

0.70 -3 0.09

0.30 0 0.30

0.50 3 4.00

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-58.php)

**59.** Write a Python program to split fractional and integer parts of a floating point number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

(F) (I)

0/2 = 0.0 (0.0, 0.0)

1/2 = 0.5 (0.5, 0.0)

2/2 = 1.0 (0.0, 1.0)

3/2 = 1.5 (0.5, 1.0)

4/2 = 2.0 (0.0, 2.0)

5/2 = 2.5 (0.5, 2.0)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-59.php)

**60.** Write a Python program to parse math formulas and put parentheses around multiplication and division. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Sample data : 4+5\*7/2

Expected Output :

4+((5\*7)/2)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-60.php)

**61.** Write a Python program to describe linear regression. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Note : A linear regression line has an equation of the form Y = a + bX, where X is the explanatory variable and Y is the dependent variable. The slope of the line is b, and a is the intercept (the value of y when x = 0).

Expected Output :

Enter the number of data points: 2

X1: 1

Y1: 2

X2: 3

Y2: 4

Best fit line:

y = 1.0x + 1.0

Enter a value to calculate: 12

y = 13.0

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-61.php)

**62.** Write a Python program to calculate a grid of hexagon coordinates of the given radius given lower-left and upper-right coordinates. The function will return a list of lists containing 6 tuples of x, y point coordinates. These can be used to construct valid regular hexagonal polygons. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

[[(-5.0, -4.196152422706632), (-5.0, -0.7320508075688767), (-2.0, 1.0), (1.0, -0.

7320508075688767), (1.0, -4.196152422706632), (-2.0, -5.928203230275509), (-5.0,

-4.196152422706632)], [(1.0, -4.196152422706632), (1.0, -0.7320508075688767), (4.

0, 1.0), (7.0, -0.7320508075688767), (7.0, -4.196152422706632).......

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-62.php)

**63.** Write a Python program to create a simple math quiz. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\* A Simple Math Quiz \*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. Addition

2. Subtraction

3. Multiplication

4. Integer Division

5. Exit

------------------------

Enter your choice: 1

Enter your answer

1 + 5 = 6

Correct.

.........

Your score is 100.0%. Thank you.

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-63.php)

**64.** Write a Python program to calculate the volume of a tetrahedron. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Note: In geometry, a tetrahedron (plural: tetrahedra or tetrahedrons) is a polyhedron composed of four triangular faces, six straight edges, and four vertex corners. The tetrahedron is the simplest of all the ordinary convex polyhedra and the only one that has fewer than 5 faces.

Expected Output :

117.85

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-64.php)

**65.** Write a Python program to compute the value of e(2.718281827...) using infinite series. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

The mathematical constant e

2.7182818282861687

2.718281828459045

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-65.php)

**66.** Write a Python program to create an ASCII waveform. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

#

\*

#

\*

.......

#

\*

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-66.php)

**67.** Write a Python program to create a dot string. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

.

.

.

.

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[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-67.php)

**68.** Write a Python program to create a Pythagorean theorem calculator. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Note : In mathematics, the Pythagorean theorem, also known as Pythagoras' theorem, is a fundamental relation in Euclidean geometry among the three sides of a right triangle. It states that the square of the hypotenuse (the side opposite the right angle) is equal to the sum of the squares of the other two sides.

Expected Output :

Pythagorean theorem calculator! Calculate your triangle sides.

Assume the sides are a, b, c and c is the hypotenuse (the side opposite the right

angle

Which side (a, b, c) do you wish to calculate? side>a

Input the length of side b:10

Input the length of side c:20

The length of side a is

17.320508075688775

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-68.php)

**69.** Write a Python function to round up a number to specified digits. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Original Number: 123.01247

124

123.1

123.02

123.013

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-69.php)

**70.** Write a Python program for casino simulation. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Exp 0

Exp 1

Exp 2

Exp 3

Exp 4

.......

Exp 998

Exp 999

Average max amount earned 10493.144 with standard deviation 50.892644498001886

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-70.php)

**71.** Write a Python program to reverse a range. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

range(9, -1, -2)

range(4, 0, -1)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-71.php)

**72.** Write a Python program to create a range for floating numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

[0.0, 0.1, 0.2, 0.30000000000000004, 0.4, 0.5, 0.6000000000000001, 0.700000000000

0001, 0.8, 0.9, 1.0]

01, 0.7000000000000001, 0.8, 0.9, 1.0]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-72.php)

**73.** Write a Python program to generate (given an integer n) a square matrix filled with elements from 1 to n raised to the power of 2 in spiral order. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

[[1, 2, 3], [8, 9, 4], [7, 6, 5]]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-73.php)

**74.** Write a Python program to select a random date in the current year. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

2016-02-08

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-74.php)

**75.** Write a Python program to calculate clusters using Hierarchical Clustering method. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input number of points.> 2

Input point (eg. 1,1)A> 1,2

Input point (eg. 1,1)B> 3,4

Distance matrix no.1:

[0.0, 2.83]

[2.83, 0.0]

Cluster is : [AB]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-75.php)

**76.** Write a Python program to implement Euclidean Algorithm to compute the greatest common divisor (gcd). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

304 = 2 \* 150 + 4

150 = 37 \* 4 + 2

4 = 2 \* 2 + 0

gcd is 2

.........

6 = 2 \* 3 + 0

gcd is 3

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-76.php)

**77.** Write a Python program to convert RGB color to HSV color. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

(0, 0.0, 100.0)

(120.0, 100.0, 84.31372549019608)

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-77.php)

**78.** Write a Python program to find perfect squares between two given numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

[]

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-78.php)

**79.** Write a Python program to compute Euclidean distance. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Note: In mathematics, the Euclidean distance or Euclidean metric is the "ordinary" (i.e. straight-line) distance between two points in Euclidean space. With this distance, Euclidean space becomes a metric space. The associated norm is called the Euclidean norm.

Expected Output :

Euclidean distance from x to y: 4.69041575982343

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-79.php)

**80.** Write a Python program to convert an integer to a 2 byte Hex value. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

1 --> 0x01

2 --> 0x02

3 --> 0x03

4 --> 0x04

5 --> 0x05

6 --> 0x06

7 --> 0x07

8 --> 0x08

9 --> 0x09

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-80.php)

**81.** Write a Python program to generate a series of unique random numbers. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

16

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-81.php)

**82.** Write a Python program to convert a given float value to ratio. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

21/5

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-82.php)

**83.** Write a Python program to calculate the aliquot sum of an given integer. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Input value: 15

('Aliquot Sum', 9)

Input value: 12

('Aliquot Sum', 16)

Input value: -6

Input must be positive

Input value: 12.22

Input must be an integer

Input value: zz

Input must be an integer

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-83.php)

**84.** Write a Python program to get the nth tetrahedral number from a given integer(n) value. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Original Number: 1

Tetrahedral number: 1.0

Original Number: 2

Tetrahedral number: 4.0

Original Number: 6

Tetrahedral number: 56.0

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-84.php)

**85.** Write a Python program to get the sum of the powers of all the numbers from start to end (both inclusive). [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

650

6084

618507

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-85.php)

**86.** Write a Python program to calculate the Hamming distance between two given values. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Hamming distance between 2 and 3 is 1

Hamming distance between 43 and 87 is 5

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-86.php)

**87.** Write a Python program to cap a number within the inclusive range specified by the given boundary values x and y. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

4

-1

10

10

5

10

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-87.php)

**88.** Write a Python program to check whether a given number is a Disarium number or unhappy number. [Go to the editor](https://www.w3resource.com/python-exercises/math/index.php#EDITOR)

Expected Output :

Is 25 is Disarium number? False

Is 89 is Disarium number? True

Is 75 is Disarium number? False

Is 125 is Disarium number? False

Is 518 is Disarium number? True

[Click me to see the sample solution](https://www.w3resource.com/python-exercises/math/python-math-exercise-88.php)