

Solve a quadratic equation with one variable using Python.

This article will guide you on how to solve a quadratic equation with one variable $ax^2 + bx + c = 0$ ($a, b \neq 0$) using Python, an equation you learned in 9th grade.

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Picture 1 of Solve a quadratic equation with one variable using Python.

using Python, an equation you learned in 9th grade. Before we start writing the program in Python, we must first know how to solve a quadratic equation:

How to solve a quadratic equation with one variable

Solving a quadratic equation means finding the values of x such that when x is substituted into the equation, the result is satisfied

Picture 2 of Solve a quadratic equation with one variable using Python.

Step 1: Calculate $\Delta = b^2 - 4ac$

Step 2: Compare Δ with 0

1. $\Delta < 0 \Rightarrow$ equation (1) has no solution
2. $\Delta = 0 \Rightarrow$ equation (1) has a double root

Picture 3 of Solve a quadratic equation with one variable using Python.

3. $\Delta > 0 \Rightarrow$ equation (1) has 2 distinct solutions, we use the following solution formula :

Picture 4 of Solve a quadratic equation with one variable using Python.

and

Picture 5 of Solve a quadratic equation with one variable using Python.

Solve quadratic equations with one variable using Python.

Step 1 : Allow the user to input three numbers: a, b, c, with the condition that a and b $\neq 0$.

Step 2 : Calculate Delta (?)

Step 3 : Based on the analysis of the quadratic equation above, we can use the following formula to calculate the roots of the quadratic equation:

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where `sqrt()` is the function for calculating the square root.

Python code to solve a quadratic equation with one variable:

```
import math
print("Gi?i ph??ng tr?nh b?
c 2: ax2 + bx + c = 0 (a, b kh?c 0)")
print("B?n ?ang làm bài t?
p Python trên QuanTriMang")
print("=====")
# Nh?p s? a, b và ki?
m tra ?i?u ki?n kh?c 0
a = float(input("M?i b?n nh?p h? s?
a: "))
while True:
    if a == 0:
        a = float(input("S? a ph?i kh?c 0. M?i nh?
p l?i s? a: "))
    else:
        break
b = float(input("M?i b?n nh?p h? s?
b: "))
while True:
    if b == 0:
        b = float(input("S? b ph?i kh?c 0. M?i nh?
p l?i s? b: "))
    else:
        break
# Nh?p s? c
c = float(input("M?i b?n nh?p h? s?
c: "))
# T?nh Delta
delta = b**2 - 4 * a * c
# T?m nghi?m c?a ph??
ng tr?nh
if delta < 0:
    print("Ph??ng tr?nh v?o nghi?
m")
elif delta == 0:
    print("Ph??ng tr?nh c?o nghi?
m k?p
x1 = x2 = ", -(b / (2 * a)) )
else:
    print("Ph??ng tr?nh c?o hai nghi?
m ph?n bi?
t:")
print("x1 = ", (-(b) + math.sqrt(delta))/(2*a) )
print("x2 = ", (-(b) - math.sqrt(delta))/(2*a) )
```

Try running the code above using QuanTriMang's Python Online tool and see the results! Here are some examples you can try:

1. Picture 6 of Solve a quadratic equation with one variable using Python.
(a=1, b=-3, c=2)
2. Picture 7 of Solve a quadratic equation with one variable using Python.
(a=1, b=1, c=-6)

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