

DWAYNE FRASER

```
import math
import matplotlib.pyplot as plt
import numpy as np
```

Problem 1. Quadratic Equations

LOOP

while True:

GETS USER INPUT FOR: a,b,c

print("Enter a:")

a = **input**()

Will Exit Loop if user presses 'Enter'

if not a:

break

print("Enter b:")

b = **input**()

print("Enter c:")

c = **input**()

a = **float**(a)

b = **float**(b)

c = **float**(c)

Calculates the discriminant

discriminant = (b**2) - (4*a*c);

Computing Solutions

if discriminant < 0:

print("This equation has no real solutions")

Plotting Graph

x = np.linspace(-10, 10, 150)

y = (a*x**2 + b*x + c);

plt.plot(x,y)

plt.grid(True)

plt.axhline(0, color='black')

plt.axvline(0, color='black')

plt.show()

elif discriminant == 0:

x1 = (-b + math.sqrt(discriminant))/(2*a)

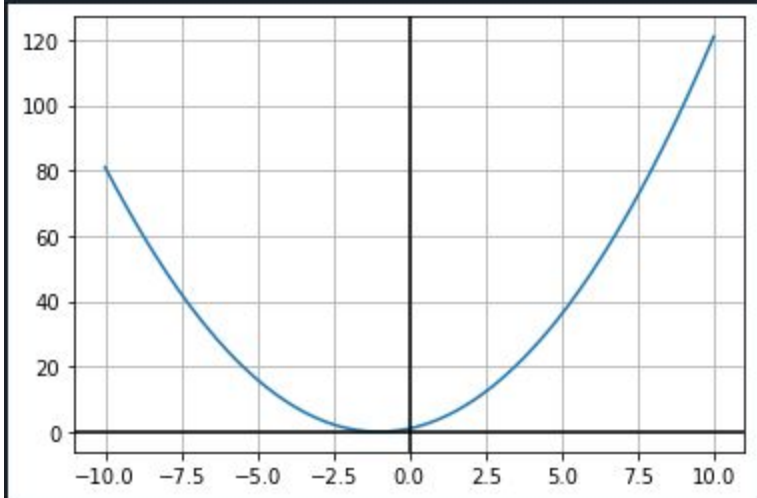
print("One solution: ")

print("x1 = ", x1)

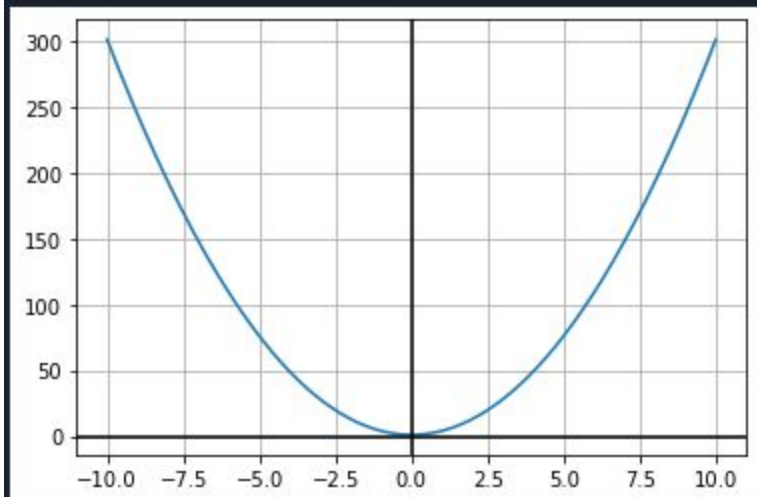
Plotting Graph

x = np.linspace(-10, 10, 150)

```
Enter a:
1
Enter b:
2
Enter c:
1
One solution:
x1 = -1.0
```



```
Enter a:
3
Enter b:
0
Enter c:
1
This equation has no real solutions
```



```

y = (a*x**2 + b*x + c);
plt.plot(x,y)
plt.grid(True)
plt.axhline(0, color='black')
plt.axvline(0, color='black')
plt.show()

```

elif discriminant > 0:

```

x1 = (-b + math.sqrt(discriminant))/(2*a)
x2 = (-b - math.sqrt(discriminant))/(2*a)

```

```

print("Two solutions: ")
print("x1 = ", x1)
print("x2 = ", x2)

```

Plotting Graph

```

x = np.linspace(-10, 10, 150)
y = (a*x**2 + b*x + c);
plt.plot(x,y)
plt.grid(True)
plt.axhline(0, color='black')
plt.axvline(0, color='black')
plt.show()

```

Enter a:

1

Enter b:

-1

Enter c:

-6

Two solutions:

x1 = 3.0

x2 = -2.0

