Pine Chapter 2 Problems

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Problem 1

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# Chapter 2 Problem 1

g = 9.81 # Acceleration due to gravity in m/s^2
h0 = 1.6 # Initial height in m
v0 = 14.2 # Initial velocity in m/s
t1 = 0.5 # First time of interest
t2 = 2.0 # Second time of interest

h1 = h0 +v0*t1 - 0.5*g*t1**2 # Height equations
h2 = h0 +v0*t2 - 0.5*g*t2**2
v1 = v0 - g*t1 # Velocity equations
v2 = v0 - g*t2

print(h1,v1,h2,v2)
```

Problem 2

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# Chapter 2 Problem 2

import numpy as np

# Initial values
V0 = 10
a = 2.5
z1 = 13./3
z2 = 26./3
z3 = 13

# Equations
V1 = V0*(1 - z1/np.sqrt(a**2 + z1**2))
V2 = V0*(1 - z2/np.sqrt(a**2 + z2**2))
V3 = V0*(1 - z3/np.sqrt(a**2 + z3**2))

print(V1,V2,V3)
```

Problem 3

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# Chapter 2 Problem 3

import numpy as np

a = (2 + np.e**2.8)/(np.sqrt(13) - 2)
b = (1 - (1 + np.log(2))**-3.5)/(1 + np.sqrt(5))
c = np.sin((2 - np.sqrt(2))/(2 + np.sqrt(2)))

print(a,b,c)
```

Problem 4

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# Chapter 2 Problem 4

import numpy as np

# Coefficients
a = 1.+0j
b = 2.+0j
c = 3.+0j

# Quadratic formulas
x1 = (-b + np.sqrt(b**2 - 4*a*c))/(2*a)
x2 = (-b - np.sqrt(b**2 - 4*a*c))/(2*a)

print(x1,x2)
```

Problem 5

```
#Chapter 2 Problem 5

import numpy as np

n = (3,4,5,100,10000,1000000) # Number of sides
n = np.array(n) # Makes an array of the list n
p = n*np.sin(np.pi/n) # Perimeter

print(p)
```