

Tan-tastic Equation

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CATEGORY: Cryptography


Tan-tastic Equation


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The decimals whisper secrets, but only the tangent listens.
Multiply the scream by a thousand, then snatch the low bits.
Absolute tantrums only — the sign is lying to you.
Each byte hides in plain sight; many pi-steps will lead you astray.
Dare to reverse the spiral: given the byte, conjure the coordinate.
Precision is your ally, chaos is your canvas.
Decode the hidden song — the flag waits at the tip of your tangent.

Unlock Hint for 10 points

 coordinates.t...

 eqn.txt

STEP BY STEP SOLUTION

Opening the eqn.txt provided we find some this base64 encoded text

"eSA9ICggZmxvb3loIHx0YW4oeCl8lCogMTAwMCApICkgJSAyNTY=" which when decoded gives "y = (floor(|tan(x)| * 1000)) % 256"

Now, opening the coordinates.txt file we find a list of numbers.... Let us see what we get when we plug in each of those numbers into the equation we just found out (using the following python code) :

```
import math
```

```
numbers = [0.07336807223576997938, 3.20998581450994846520, 6.35058307089782569932,  
9.54765576060061427199, 12.61981965838150365755, 15.80713684646701011616,  
18.96355944653141989420, 22.04060820533660347564, 25.24477019114433318236,
```

```
28.32977700276811106050, 31.52103771542342158796, 34.66757271170636300894,
37.80224462779982985694, 40.93591574715033942766, 44.03175678046515173492,
47.17733884786922260446, 50.36069370791971522294, 53.52206558355997145782,
56.66069672704226434234, 59.73972004841411376219, 62.93102665031390330341,
66.09435309460917551405, 69.23988565088075120002]
```

```
for i in numbers:
    print(math.floor(abs(math.tan(i))*1000) % 256, end= " ")
```

We find the following output:

```
===== RESTART: C:/Users/admin/Desktop/tantasticeqn.py =====
73 68 67 123 53 99 114 49 112 55 105 110 103 95 49 53 95 115 112 49 99 121 125
```

Hmm...those look like ASCII values of the message
Let's decode it using this slightly changed code

```
import math

numbers = [0.07336807223576997938, 3.20998581450994846520, 6.35058307089782569932,
9.54765576060061427199, 12.61981965838150365755, 15.80713684646701011616,
18.96355944653141989420, 22.04060820533660347564, 25.24477019114433318236,
28.32977700276811106050, 31.52103771542342158796, 34.66757271170636300894,
37.80224462779982985694, 40.93591574715033942766, 44.03175678046515173492,
47.17733884786922260446, 50.36069370791971522294, 53.52206558355997145782,
56.66069672704226434234, 59.73972004841411376219, 62.93102665031390330341,
66.09435309460917551405, 69.23988565088075120002]

for i in numbers:
    print(chr(math.floor(abs(math.tan(i))*1000) % 256), end= "")
```

And we have the flag

```
===== RESTART: C:/Users/admin/Desktop/tantasticeqn.py =====
IDC{5cr1p7ing_15_sp1cy}
```

FLAG: IDC{5cr1p7ing_15_sp1cy}