VISIT MATH

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Answers

Step 1: Believe in Mathemagic

Only two runes are not determined, so the combinations are 4+4*3/2=4+6=10.

Step 2: On the sequence

Algebra: For some n we have that F(n)+F(n+2)=843. Since F(n+2)=F(n)+F(n+1), we get F(n)+F(n)+F(n+1)=843. Now we use that F(n+1)=377, obtaining 2F(n)+377=843, so F(n)=233. Hence the third term is F(n+2)=F(n) +F(n+1)=233+377=610.

Probability: Every 3 terms of the sequence one is even and two are odd, starting with an even number. So in the first 20 terms of the sequence there are 7 even numbers, hence the probability is 7/20.

Analysis: If you put on a spredsheet 0 in A1, 1 in A2, then in A3 you put =A1+A2 and automatically calculate from A3 to A15.

Step 3: Fight the beast

We have A=n+3, B=n-2, 2A+B/2=380, so 2(n+3)+(n-2)/2=380, so n=150.

Step 4: Hold the tower

The height difference between the lowest point and the highest point of the base is 15.484 · sin(3.97) = 1.07 meter.
The radius of the last ring measure (56.705−55.863)/2 sin(3.97) , that is equal to 6.08 meter.

Step 5: The strongest school

The total cost depending on n is **c(n) = 40000 + n^2**, the total income is **i(n) = n(400 + 6000/n) = 400n + 6000**, so the profit is **p(n) = i(n) − c(n) = −n^2 + 400n − 36000**.
The profit function is a parable, that has a maximum at his vertex. Using the formula for finding the vertex of a parable it gives that the maximum is for **n = (−400)/(−2) = 200**, which is the solution.

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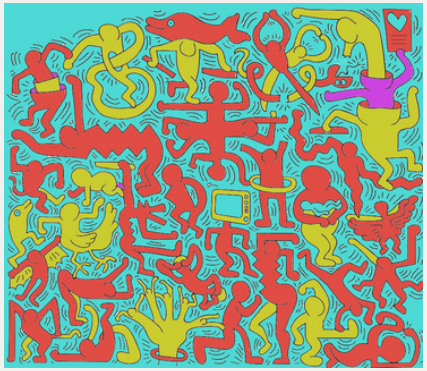
Step 6: Clock cypher

The first step is to associate at each letter the corresponding number following the alphabet order, starting with A → 0. So A → 0, B → 1, . . . , Z → 25.
Then we put the message and the corresponding letters from the Divine Comedy below:
UKUP KBEA GNGMZ CGJGZT
TUDE ISAP ERCHI FUICON
On second step we associate ad each letter the corresponding number, so we get:
20, 10, 20, 15 10, 1, 4, 0 6, 13, 6, 12, 25 2, 6, 9, 6, 25, 19
19, 20, 3, 4 8, 18, 0, 15 4, 17, 2, 7, 8 5, 20, 8, 2, 14, 13
Then we sum the two rows obtaining
39, 30, 23, 19 18, 19, 4, 15 10,30, 8, 19, 33 7, 26, 17, 8, 39, 32
Now we subtract 26 from the values greater than 25
13, 4, 23, 19 18, 19, 4, 15 10, 4, 8, 19, 7 7, 0, 17, 8, 13, 6
And going backward to the letters we get the solution
NEXT STEP KEITH HARING



Step 7: Colour magic

This is the solution with the four colours. For the existence of the parts marked in purple, it is not possible to colour it with only three colours in a way that every two border areas have different colours.

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