ABSTRACT
Nine is the highest single digit number in decimal system. It is the second non-unitary square prime of the form \(p^2\) and the first that is odd. In numerology the number nine represent completion, as it’s the last of the single digit numbers which are known as cardinal numbers. It symbolically represents a culmination of wisdom and experience, and buzzes with the energy of both endings and new beginnings. In this paper, the researcher shows a specific patterns that attributes the number 9, which occurs till infinity, which is a sought of conjecture.

KEYWORDS: Nine, conjecture, patterns, number theory.

INTRODUCTION
Number theory is synonymous of arithmetic and as such this is an arithmetic problem. The addressed problem is directly related to the basic operation and concerns the solution of equation in integers.\(^1\) In the course of this research, we deal with the natural number “9”, which shows repeated patterns when the conjecture statement rule is followed. Nine is a composite number, its proper divisors being 1 and 3.\(^1\) It is 3 times 3 and hence the third square number. Nine is a motzkin number.\(^2\) It is the first composite lucky number, along with the first composite odd number and only single digit composite number.\(^1\)

DEFINITION
Some basic definitions and conjecture which will be used in this study are presented here.
DEFINITION 1
Take a natural number \( n \) and construct an orderly sequence from \( S_1 \) to \( S_9 \) either ascending or descending, add the series \( na_1 + na_2 + \ldots + na_9 \) divide by the 5\(^{th} \) sequence. The conjecture is that if we begin with \( na_1 + na_2 + na_3 \ldots + na_9 \) and divide by \( na_5 \), you will always eventually reach 9. The strict rule of the conjecture is that the sequence should always be orderly either ascending or descending. Any random sequence, for e.g. \( 17 + 182 + 24 \) is not allowed in the conjecture, so thus any round figure like 10, 120, 60, 40, 70, 170, 00, 000, 000, is not also allowed in the conjecture.

Using a mathematical expression to present the conjecture.
\[
f(n) = \frac{na_1 + na_2 + na_3 + na_4 + na_5 + na_6 + na_7 + na_8 + na_9}{na_5}
\]
\( f(n) = 9 \)

DEFINITION 2
By giving an experimental example of the conjecture. The sequence according to the conjecture ranges from \( s_1 \) to \( s_9 \) in an orderly pattern either ascending or descending order.

\[
egin{align*}
s_1 &= a_1 \\
s_2 &= a_1 + a_2 \\
s_3 &= a_1 + a_2 + a_3 \\
s_4 &= a_1 + a_2 + a_3 + a_4 \\
s_5 &= a_1 + a_2 + a_3 + a_4 + a_5 \\
s_6 &= a_1 + a_2 + a_3 + a_4 + a_5 + a_6 \\
s_7 &= a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 \\
s_8 &= a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 \\
\end{align*}
\]
\[ s_9 = a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 \]

This conjecture only work for \( s_9 \). So we use \( s_9 \) to make an example following the conjective rule.

Let \( s_9 = 1 + 2 + \ldots + 9 \)

\[
f(n) = \frac{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9}{5} \]

\[ f(n) = \frac{45}{5} \]

\[ f(n) = 9 \]

Taking another sample

Let \( s_9 = 11 + 12 + \ldots + 19 \)

\[
F(n) = \frac{11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19}{15} \]

\[ f(n) = \frac{135}{15} \]

\[ f(n) = 9 \]

Let's use a larger number to confirm the hypothesis.

Let \( s_9 = 71,000,000,000 + 72,000,000,000 + \ldots + 79,000,000,000 \)

\[
F(n) = \frac{71,000,000,000 + 72,000,000,000 + \ldots + 79,000,000,000}{75,000,000,000} \]

\[ f(n) = 9 \]

According to the conjecture this pattern keeps repeating itself till infinity and results with the natural number 9.

**METHODOLOGY**

We use the method of inductive reasoning in which a body of observation is synthesized to come up with a general principle.\(^3\) So therefore inductive reasoning was used to make the observation. If the premises are correct a deductive argument comes in and the conclusion of the deductive argument is certain. After reasoning from one or more statement we reach a logical conclusion from deduction.\(^4\)
Pick a number n
select an orderly sequence s1 – s9 or s9 – s1
add the series a1 + a2 ... + a9
divide the total series by the 5th sequence s5
results becomes “9”

In contrast, the truth of the conclusion of an inductive argument is probable, based upon the evidence given.

RESULT AND DISCUSSION

In this section, number nine as a conjecture of infinity is presented in a table.

Table 1: Comparison of results showing the End point is always 9

<table>
<thead>
<tr>
<th>n</th>
<th>Sequence</th>
<th>Series</th>
<th>Divide by the 5th sequence</th>
<th>Ends in</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 9</td>
<td>a1 + a2 .... + a9</td>
<td>45</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>11 - 19</td>
<td>a1 + a2 .... + a9</td>
<td>135</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>21 - 29</td>
<td>a1 + a2 .... + a9</td>
<td>225</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>71,000,000 - 79,000,000</td>
<td>a1 + a2 .... + a9</td>
<td>6.75 x 10^{11}</td>
<td>75,000,000,000</td>
<td>9</td>
</tr>
<tr>
<td>81 - 89</td>
<td>a1 + a2 .... + a9</td>
<td>765</td>
<td>85</td>
<td>9</td>
</tr>
<tr>
<td>61 - 69</td>
<td>a1 + a2 .... + a9</td>
<td>585</td>
<td>65</td>
<td>9</td>
</tr>
<tr>
<td>179 – 171</td>
<td>a9 + a8 .... + a1</td>
<td>1,575</td>
<td>175</td>
<td>9</td>
</tr>
</tbody>
</table>
CONCLUSION

The researcher has successfully shown the importance of number nine, by using inductive reasoning to point out a new conjecture, that follows a particular pattern till infinity. So many structure, topology and physical phenomenon tends to carry or follow the number nine rule. Nature follows the number nine if we look deeply into the golden ratio. In the end the researcher have come with a conclusion that the natural number following eight and preceding 10 is indeed a special number.

REFERENCES


