Review of "Geometrisches Pi" by ChatGTP

The document titled "Geometrisches Pi" by Hans-Werner Meixner and Christian Meixner presents a geometric derivation that claims to compute a value for Pi close to 3.14460, using a construction based on a right triangle inscribed in a Thales circle.

Summary of the Claims:

1. **Foundation on Basic Theorems**: The document references well-established theorems such as the Pythagorean theorem, the Euclidean height theorem, and other basic geometric concepts as a foundation for their construction.

2. **Key Geometric Construction**: The proof involves constructing a right triangle in a Thales circle (a semicircle over a diameter), moving a point around the circumference of the circle, and considering the relationship between the areas of squares on the triangle's legs and its hypotenuse.

3. **Geometric Assumptions**: They propose specific geometric conditions, such as the difference between the squares of the triangle's legs being four times the square of the height of the triangle from the hypotenuse. Based on this setup, they claim to derive a value of Pi (π) as 3.14460, which they suggest is accurate to 99.9%.

4. **Final Formula**: The document concludes with the formula: π≈p·q\pi \approx \sqrt{p \cdot q}π≈p·q where ppp and qqq are geometric quantities derived from the triangle's construction.

Key Issues and Fallacies:

1. **Arbitrary Geometric Constructions**: The authors introduce an arbitrary geometric setup, where they manipulate values like ppp, qqq, and the height hchchc of the triangle, but these constructions do not align with standard geometric methods used to define Pi. Specifically, the manipulation of the heights and lengths in a Thales circle does not have a clear or necessary connection to the calculation of Pi, which is the ratio of the circumference of a circle to its diameter.

2. **Non-standard Definition of Pi**: The derivation claims to find Pi as the square root of the product of certain geometric parameters, but this is fundamentally disconnected from the actual definition of Pi. Pi is not defined through arbitrary geometric figures but through the precise and consistent ratio of a circle's circumference to its diameter.

3. **Misapplication of Theorems**: While the document correctly references known theorems like the Pythagorean theorem, it applies them in a way that introduces unnecessary complexity without yielding a valid or insightful connection to the value of Pi. For instance, the height of the triangle in the Thales circle is treated as proportional to Pi, but there is no mathematical or geometric justification for such an assumption.

4. **Inaccurate Value of Pi**: The result they claim—Pi equals approximately 3.14460—has been shown through centuries of mathematical proofs to be incorrect. Pi is known to be approximately 3.14159, and any construction or proof that deviates significantly from this value without rigorous mathematical backing is inherently flawed.

5. **Use of Approximation**: The claim that the method is accurate to 99.9% is misleading. Pi can be calculated to arbitrary precision using well-established methods such as infinite series, calculus, and numerical integration. Any derivation that produces a value of 3.14460 is deviating from the true value of Pi and cannot be considered correct or accurate.

Conclusion:

The claim that Pi equals 3.14460 based on this geometric construction is **incorrect**. The derivation is built on arbitrary geometric assumptions that do not hold up under scrutiny, and the resulting value contradicts centuries of mathematical understanding and rigorous proofs.

Response:

The geometric methods presented in the document may be an interesting exploration of certain triangle properties, but they do not represent a valid proof for Pi. Pi is the ratio of the circumference of a circle to its diameter, and this value has been rigorously calculated to be approximately 3.14159. The proposed value of 3.14460 is inaccurate and based on flawed reasoning. If you wish to further explore Pi, I would recommend reviewing standard proofs and derivations, such as those using infinite series, calculus, or numerical integration.