



*Let's Examine Conjectures
About Numbers Using
Algebraic & Geometric
Reasoning*



**NCTM ANNUAL MEETING
NEW ORLEANS LA
APRIL 9-12, 2014**

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Standards

for

Mathematical Practice

- 1. Make sense of problems and persevere in solving them.**
- 2. Reason abstractly and quantitatively.**
- 3. Construct viable arguments and critique the reasoning of others.**



- 4. Model with mathematics.**
- 5. Use appropriate tools strategically.**
- 6. Attend to precision.**
- 7. Look for and make use of structure.**
- 8. Look for and express regularity in repeated reasoning.**



$$3 + 5$$

$$29 + 31$$

$$5 + 7$$

$$41 + 43$$

$$11 + 13$$

$$59 + 61$$

$$17 + 19$$

$$71 + 73$$



WHY?

**CONJECTURING CAN HELP
DEEPEN UNDERSTANDING
THROUGH:**

- **EMPOWERING
& BUILDING OWNERSHIP**
- **IMPROVING COMMUNICATION
& REASONING SKILLS**
- **LEARNING FROM MISTAKES**



MAKE
CONJECTURES
THAT ADDRESS
NATURAL NUMBERS
WRITTEN IN TERMS
OF CONSECUTIVE
NATURAL
NUMBERS.



NAME _____

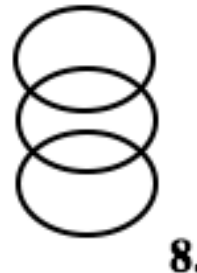
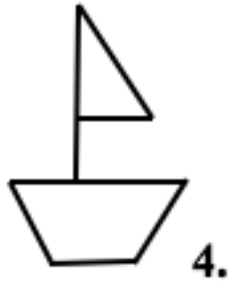
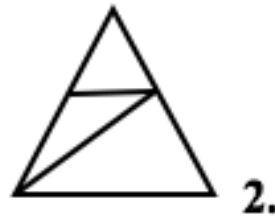
DOODLE COUNT

For each doodle,
count V, F, E and
record in table.

Find a pattern.



	V Vertices	F Faces	E Edges
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			





NAME: _____ DOODLE COUNT

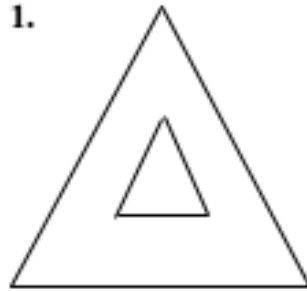
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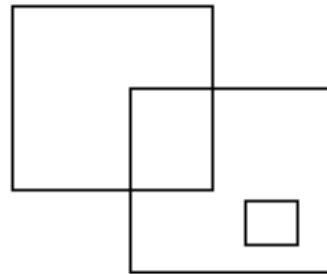
	V Vertices	F Faces	E Edges
1.			
2.			
3.			
4.			
5.			
6.			
7.			



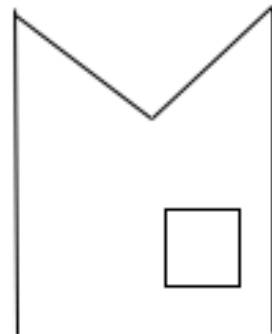
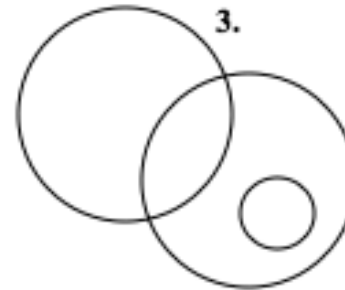
1.



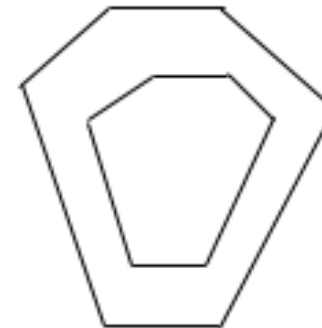
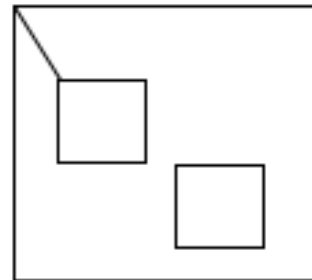
2.



3.



5.

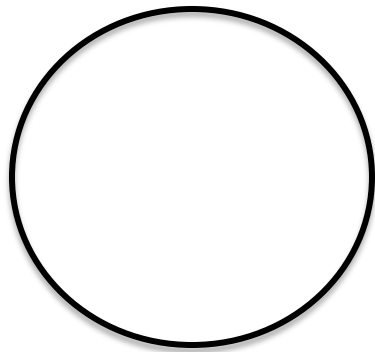


6.

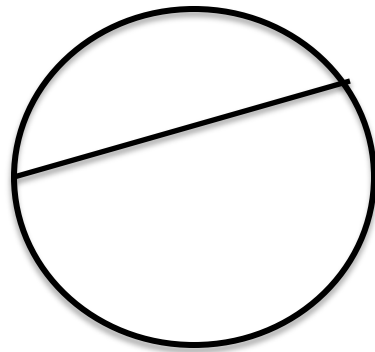
4.



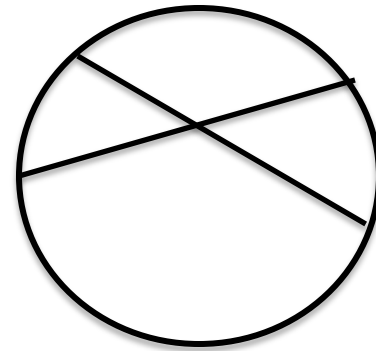
Explore: The max region count within a circle determined by 3 chords



0 - 1



1 - 2

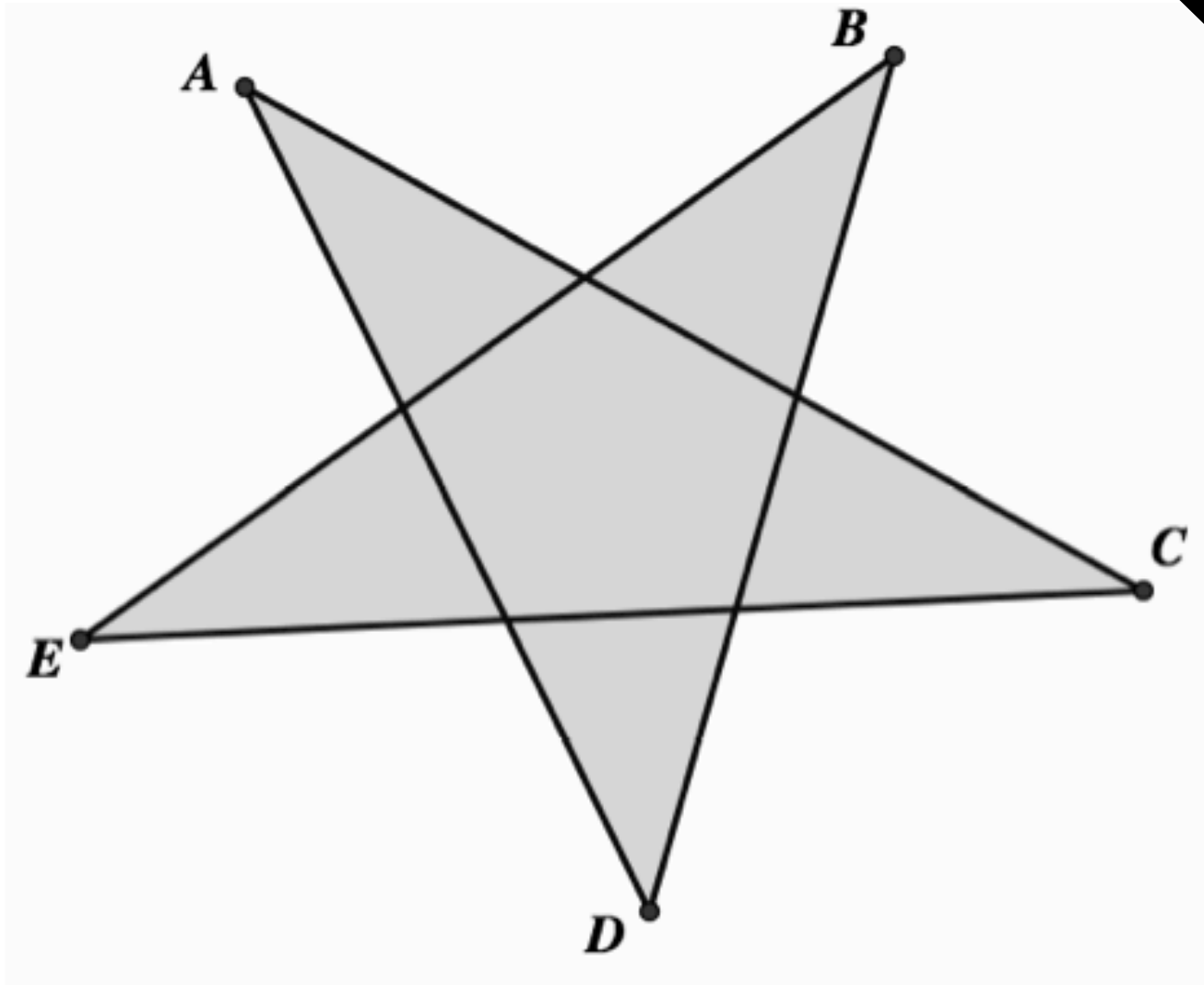


2 - 4

Conjectures:



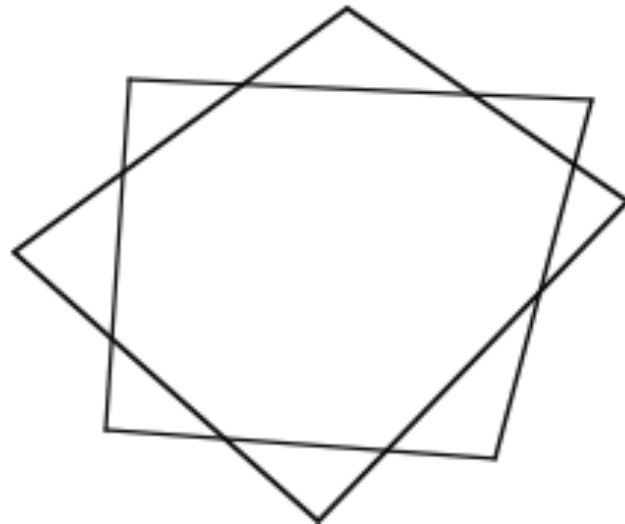
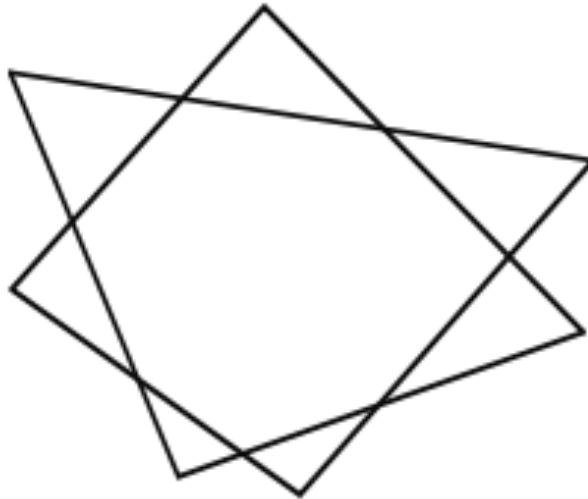
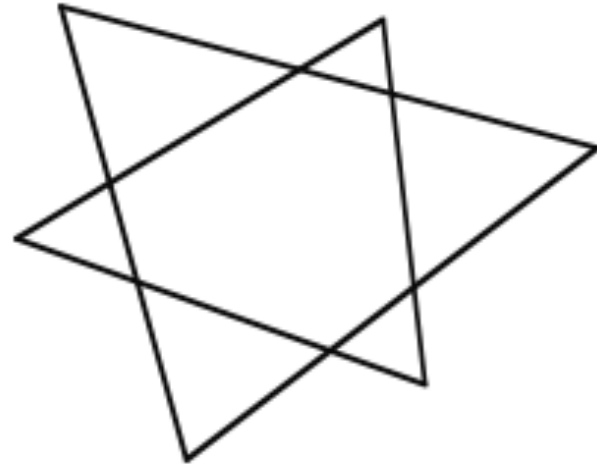
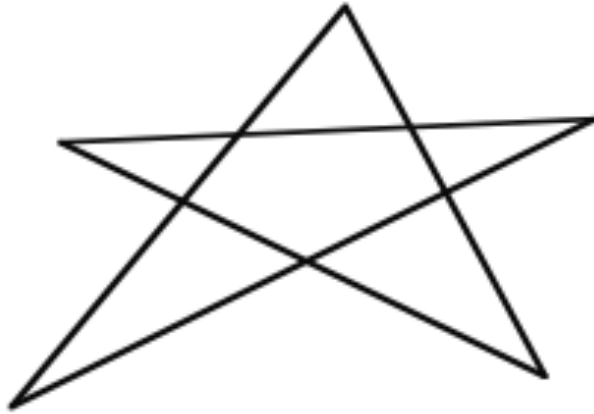
- On a 5×5 geoboard there are more than 50 squares.
- On a 5×5 geoboard there's a path more than 50 units long that does not intersect with itself.
- On an $n \times n$ geoboard the maximum number of interior points for a triangle is a triangular number.



**FIND THE SUM OF THE MEASURES
OF $\angle A + \angle B + \angle C + \angle D + \angle E$.**



Conjecture about the sum of the angle measures at the tips of the 5-, 6-, 7-, 8-pointed stars.



References : Conjectures, The Common Core, Problem Solving



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Common Core State Standards for Mathematics

<http://www.corestandards.org/Math>