Patterns and Inductive Reasoning

Objectives

1. Use inductive reasoning to find the next terms of a pattern

Inductive Reasoning

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Inductive Reasoning is reasoning that is based on some pattern observed.

Example 1

Look for a pattern. What are the next 2 terms in each sequence?

(a) 3, 9, 27, 81, ...

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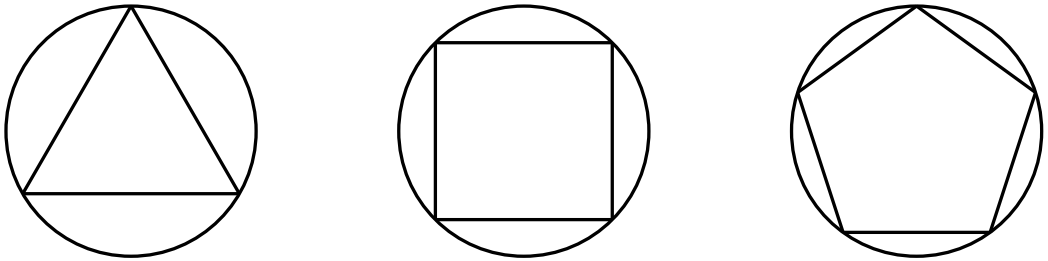
The next two terms are 243 and 729.

Example 1

(b)



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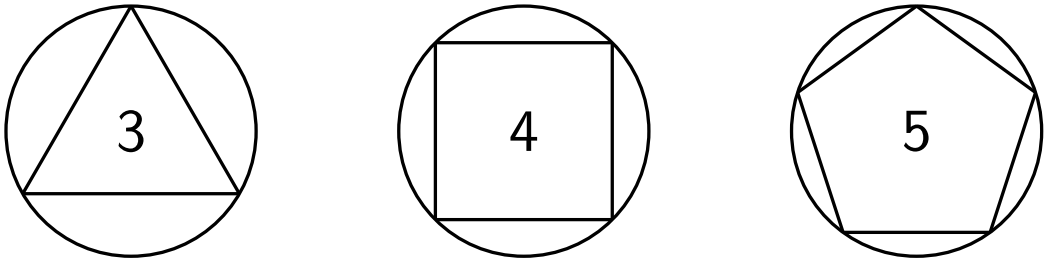

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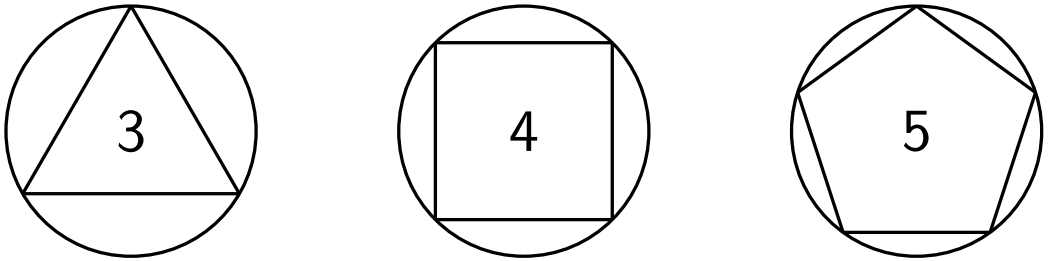

Each has a circle and number of sides increases by 1 each time.

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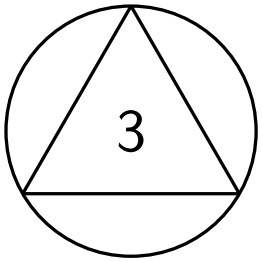

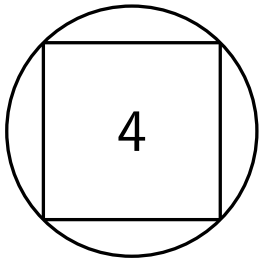

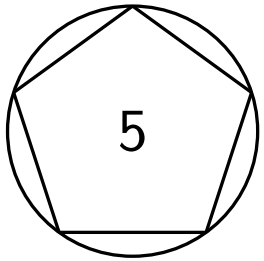

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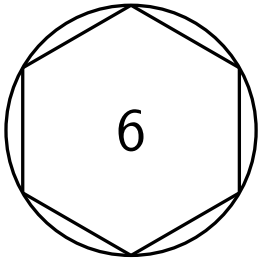

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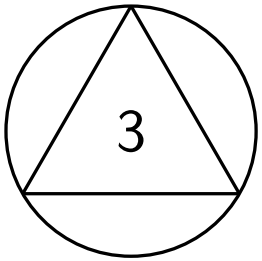

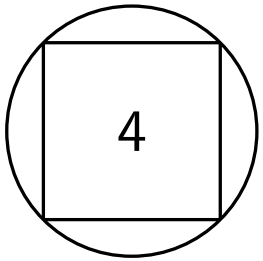

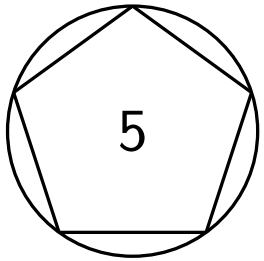

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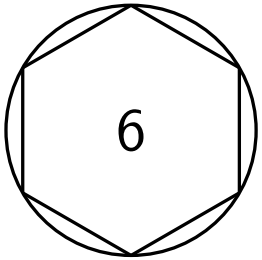

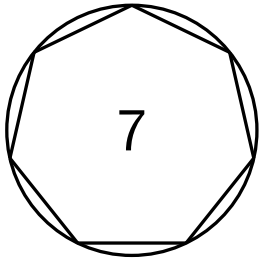

Conjectures

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A **conjecture** is a conclusion you reach based on inductive reasoning.

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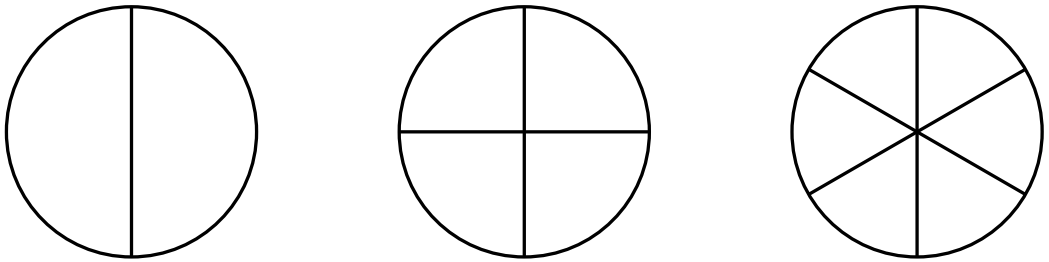
Look at the circles. What conjecture can you make about the number of regions 20 diameters form?



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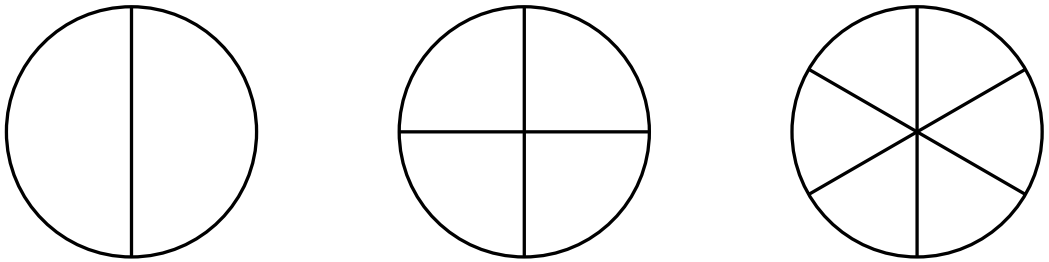

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Num regions	2	4	6	...	

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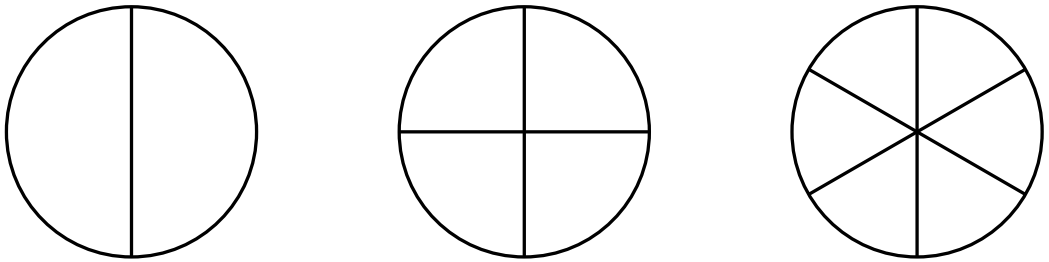

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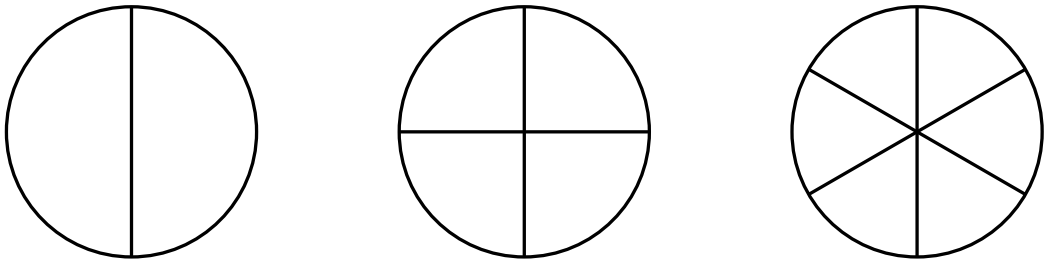

Num diam	1	2	3	...	20
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Counterexamples

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A **counterexample** is an example that shows a conjecture is incorrect.

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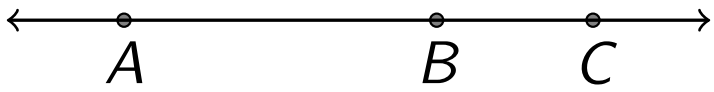

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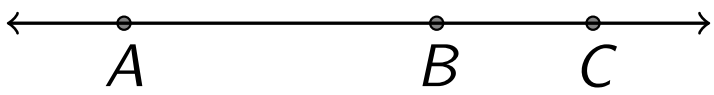

(c) When you multiply a number by 2, the product is greater than the original number.

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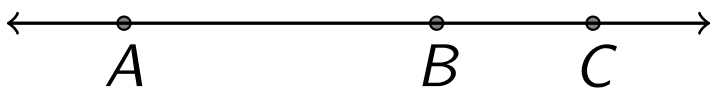

(c) When you multiply a number by 2, the product is greater than the original number.

Counterexample: $0 \times 2 = 0$