

Interesting Mathematics Content Connecting the Eight Common Core State Standards for Mathematical Practice

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Preparing to Lead in Times of Change
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Common Core Standards

Standards for Mathematical Practice (K-12)

- 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.**

Common Standards for Mathematical Content

- 1. Operations and Algebraic Thinking (3, 4, 5)**
- 2. Geometry (3, 4, 5, 6, 7, 8)**
- 3. Measurement and Data (3, 4, 5)**
- 4. Expressions and Equations (6, 7, 8)**
- 5. Functions (8)**

HS. Number and Quantity

Algebra

Functions

Modeling

Geometry

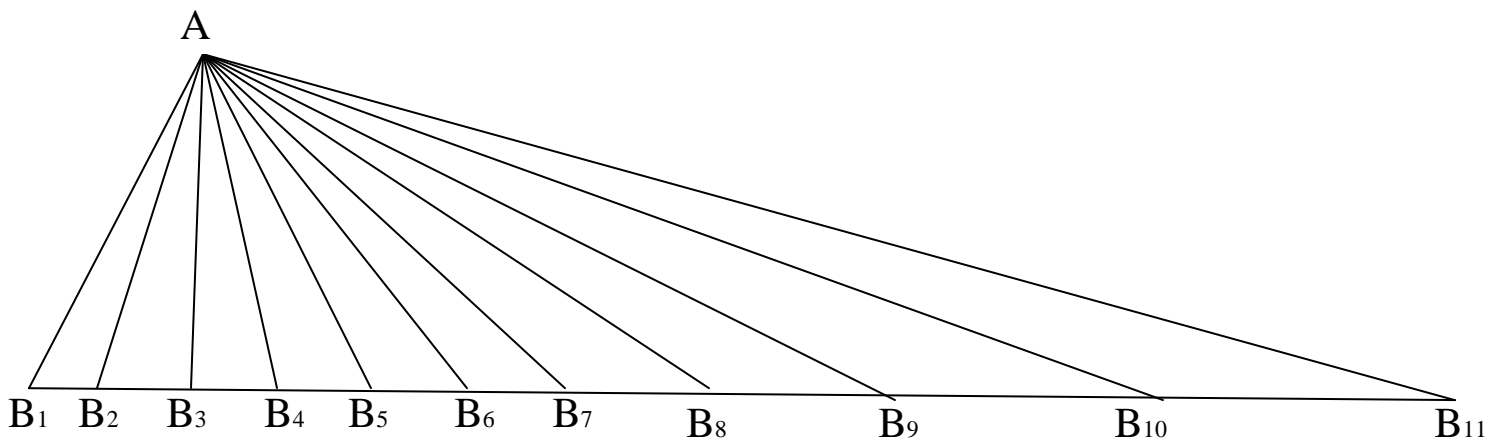
Statistics and Probability

Circular Counting

- 1. Suppose today is Monday. What day of the week will it be 10 days from now?**
- 2. Suppose today is Monday. What day of the week will it be 100 days from now?**
- 3. Suppose today is Monday. What day of the week will it be 1000 days from now?**
- 4. Suppose it is 10:00 in the morning. What time of the day will it be in 10 hours?**
- 5. Suppose it is 10:00 in the morning. What time of the day will it be in 100 hours?**
- 6. Suppose it is 10:00 in the morning. What time of the day will it be in 1000 hours?**

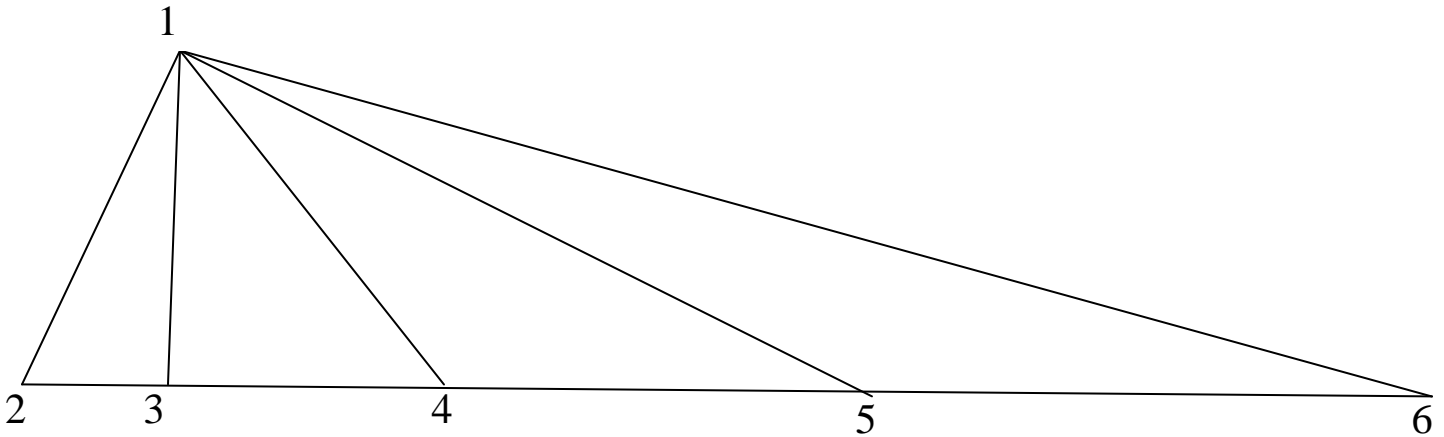
COUNTING TRIANGLES

**How many triangles are in the figure below?
Explain how you counted the triangles.**

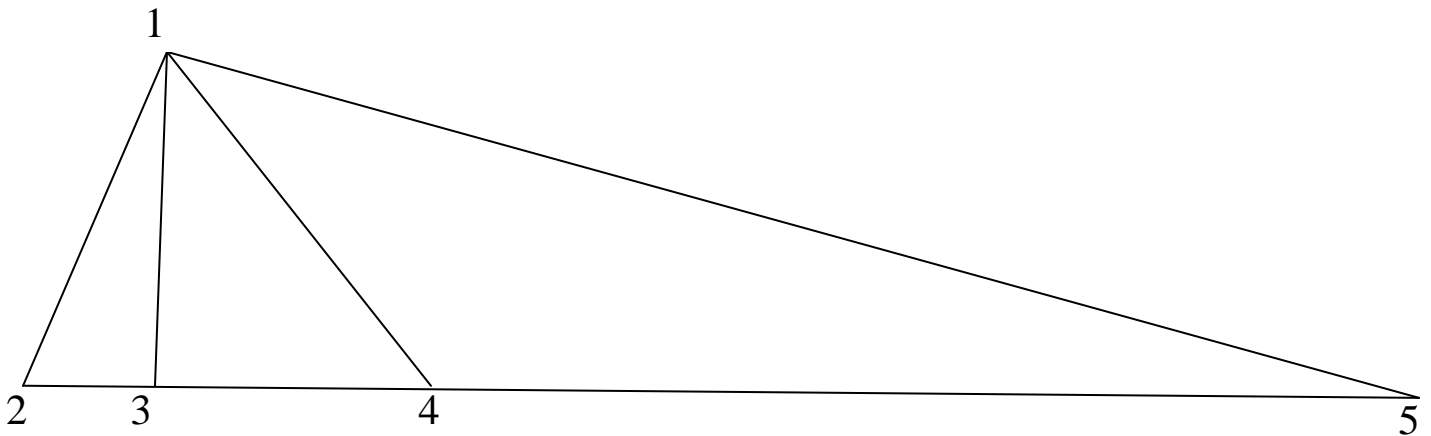


COUNTING TRIANGLES

**How many triangles are in the figure below?
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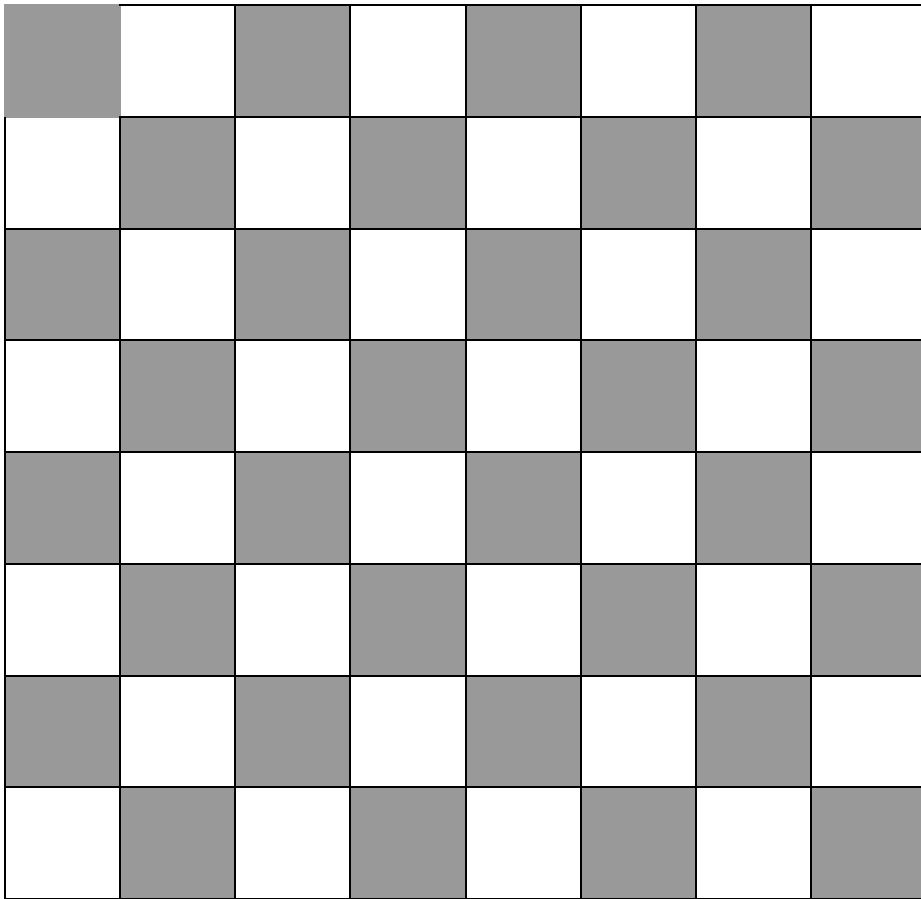


**How many triangles are in the figure below?
Explain how you counted the triangles.**



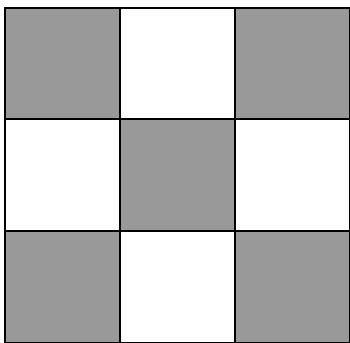
ROBERT'S PROBLEM

**How many squares are in the
8x8 checkerboard?**

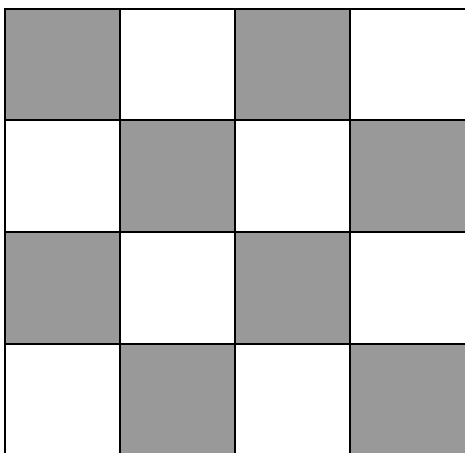


A COUNTING PROBLEM

**How many squares are in the
3x3 checkerboard?**

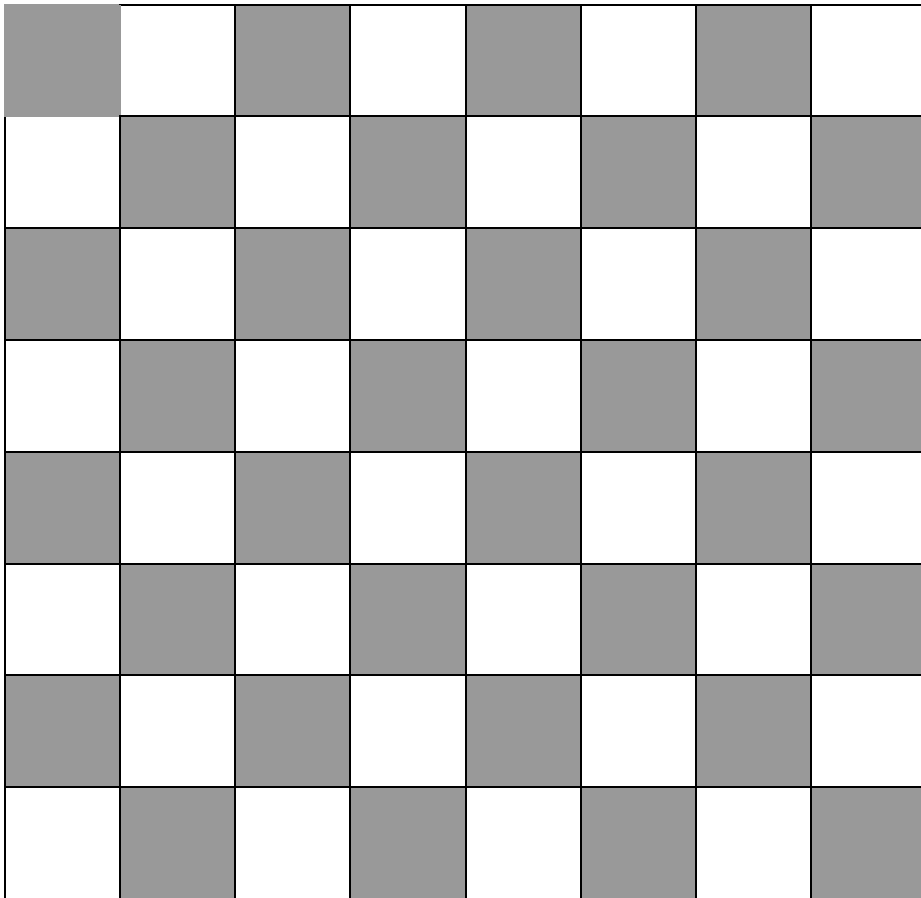


**How many squares are in the
4x4 checkerboard?**



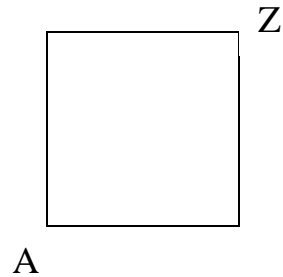
RECTANGLE PROBLEM

**How many rectangles are in the
8x8 checkerboard?**

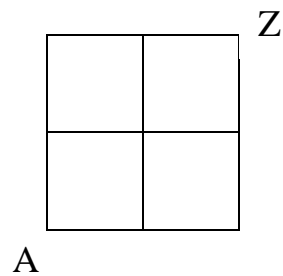


FROM A to Z

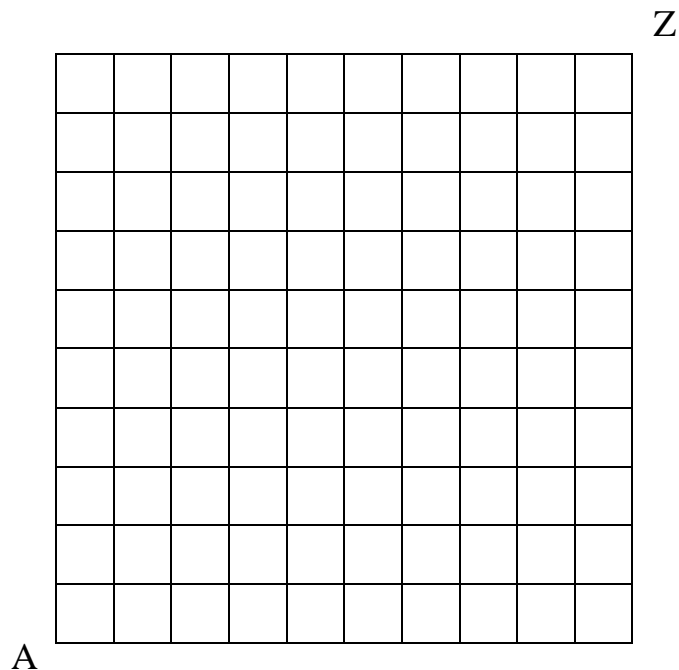
1. How many ways can you go from A to Z in the following grid if you go only move up or to the right?



2. How many ways can you go from A to Z in the following grid if you go only move up or to the right?



3. How many ways can you go from A to Z in the following grid if you go only move up or to the right?



RULER COUNTING

How many ways can you divide a 12 inch ruler if the divisions can only be made at the inch marks?



For example, this is just one of the ways a ruler can be divided.



Explain how you counted the total number.

RULER COUNTING

How many ways can you divide a 1 inch ruler?



How many ways can you divide a 2 inch ruler?



How many ways can you divide a 3 inch ruler?



How many ways can you divide a 4 inch ruler?



How many ways can you divide a 5 inch ruler?



Standards for Mathematical Practice (K-12)

1. Make sense of problems and persevere in solving them.

None Some Lots

2. Reason abstractly and quantitatively.

None Some Lots

3. Construct viable arguments and critique the reasoning of others.

None Some Lots

4. Model with mathematics.

None Some Lots

5. Use appropriate tools strategically.

None Some Lots

6. Attend to precision.

None Some Lots

7. Look for and make use of structure.

None Some Lots

8. Look for and express regularity in repeated reasoning.

None Some Lots

QUESTIONS for TEACHERS

What strategies and/or materials do you use to help students recognize patterns and relationships in their math learning?

How do you incorporate mathematical problem solving in your curriculum?

What do you do to challenge all of your students?

Which is more important to you: That your students know how to perform the mathematical algorithms and facts that you teach them or that they develop their abilities to successfully solve problems?

What do mathematicians do? or What does it mean to do mathematics?

solve problems

organize, classify, order, and count things

look for patterns

make conjectures

prove conjectures

take chances, make mistakes

find examples

find counterexamples

ask questions

apply results

discover solutions

discover more elegant solutions

explain, validate, convince

communicate questions, conjectures and results