Name _____ Date _____ Class _____

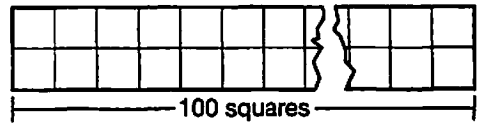
SKILL 5: PROBLEM SOLVING: Find a Pattern

Finding a pattern is a useful strategy for solving many problems in geometry.

Example

How many 2 x 2 squares can be drawn in a strip of squares 2 squares tall and 100 squares long?

Read The strip of squares is 2 squares tall and 100 squares long.



Plan Make a table showing how many 2 × 2 squares are in strips 2 squares long, 3 squares long, 4 squares long, and so on. Note: squares may overlap on the strip.

Length of strip	2	3	4	5
Number of 2 x 2 squares	1	2	3	4

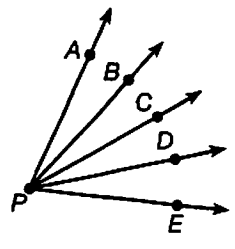
Solve Look for a pattern. Notice that each number in the second row is one less than the number above it. In a strip 2 squares tall and 100 squares long, there will be 100 − 1 or 99 of the 2 × 2 squares.

Look Back If you take the first 2 × 2 square on the left, you can move it to the right 1 small square at a time. You can do this 98 times to get the rest of the 2 × 2 squares in the strip. In all, you will have 99 of the 2 × 2 squares.

Guided Practice

Find how many angles are in the figure.

1. How many angles have $\overrightarrow{PA}$ as a side? _____
2. How many angles *not already counted* have $\overrightarrow{PB}$ as a side? _____
3. How many angles *not already counted* have $\overrightarrow{PC}$ as a side? _____
4. How many angles *not already counted* have $\overrightarrow{PD}$ as a side? _____



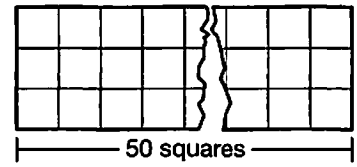
5. Total number of angles: 4 + 3 + _____ + _____ = _____ angles

Name _____ Date _____ Class _____

SKILL 5: Practice

Use patterns to solve each problem.

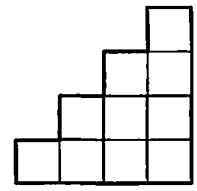
1. How many 2 x 2 squares are in a strip of squares that is 3 squares tall and 50 squares long? _____



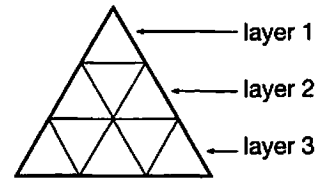
2. How many 3 x 3 squares are in a strip of squares that is 3 squares tall and 50 squares long? _____

3. How many squares are there in a strip of squares 4 squares tall and 20 squares long? (Hint: Find the number of 1 x 1 squares, 2 x 2 squares, 3 x 3 squares, and 4 x 4 squares.) _____

4. Yolanda is making staircase shapes by using square tiles, as shown in the diagram at the right. How many tiles will she need to make a staircase that is 10 tiles tall? _____

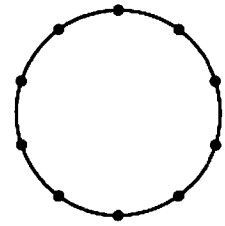


5. Lee is going to make a shape like the one shown at the right. He has exactly enough tiles for a shape with 20 layers. How many tiles does he have? _____



6. Suppose you mark 10 points on a line. How many line segments have two of these points as endpoints? _____

7. Suppose you mark 10 points on a circle. How many triangles are possible that have 3 of these points as corner points? _____



TEST PREP

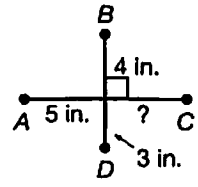
8. How many angles are formed by 7 rays that have a common endpoint?

Skill 5

A 13 **C** 21
B 15 **D** 35

9. $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$. What is the measure of $\overline{AC}$?

Skill 3



F 10 in.
G 5 in.
H 4 in.
J 3 in.