Assessment : Section A Checkpoint

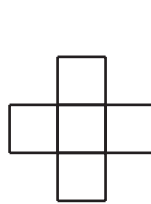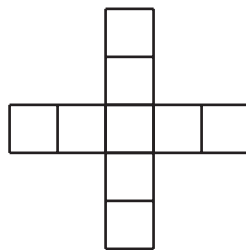## Problem 1

Goals Assessed

- Generate a number or shape pattern that follows a given rule.

Statement

Here are the first two steps of a pattern of squares that look like + symbols. At each step, 4 squares are added.

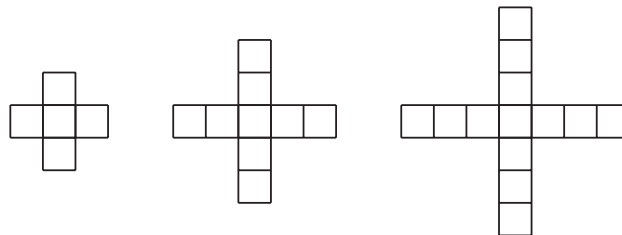step 1   step 2   step 3

1. Draw the next figure in the pattern.
2. How many squares will be needed in step 7? Explain or show your reasoning.
3. Will there be a figure that uses exactly 40 squares? Explain or show your reasoning.

Solution

1.

step 1   step 2   step 3

2. 29. Sample reasoning: There are 5 squares in step 1. Adding 4 squares 6 times takes us to step 7. $5 + (6 \times 4) = 5 + 24 = 29$.

3. No. Sample reasoning: The number of squares will always be an odd number because we start with an odd number and always add 4, an even number, each time.

Problem 2

Goals Assessed

- Generate a number or shape pattern that follows a given rule.
- Identify apparent features of a number pattern that were not explicit in the rule itself.

Statement

Here are the first three multiples of 8:

$$8, 16, 24, \ldots$$

Here are the first three multiples of 12:

$$12, 24, 36, \ldots$$

What are the next three numbers that are on both lists? Explain or show your reasoning.

Solution

48, 72, and 96. Sample reasoning:

- I extended the pattern until I found three more common numbers for the patterns.
- 24 is on both lists and going out 3 more places in the lists adds 24 more.