

Process Standards:

Students will be able to:

- Interpret results in ways that are meaningful for the given context.
- Effectively communicate their mathematical knowledge.
- Exhibit characteristics of a cooperative learner.
- Organize class materials so that they are easily accessible and able to be used as an additional resource in problem solving situations.

Content Standards:

Students will be able to:

- Select and apply appropriate computational strategies to problem solving and life situations.
- Use technology to assist in data collection and interpretation of functions.
- Perform operations and transformations on functions, polynomials, and other mathematical entities.
- Recognize equivalent forms of an expression, equation, function or relation.
- Generate equivalent forms of an expression, equation, function or relation.
- Interpret situations that involve variable quantities.
- Model a wide range of phenomena using a variety of functions.

Recall from last night's homework that the housing developer submitted plans to

the city planner for some houses she wanted to build. The planner thought that the plans were boring because the lots were all square and the same size. After some discussion, the planner and the developer decided that the lots should include other types of rectangles so the developer changed the lengths of some of the sides of the lots. The developer wrote the plans for the new lot sizes but put them in code using the variable x to represent the length of the side of the original square lots. For example, if the original square lot was extended four meters in one direction and three meters in the other, the developer represented the new lot by the factored form $(x + 4)(x + 3)$.

1. a. Draw a diagram illustrating the lot represented by the expression $(x + 4)(x + 3)$.

- b. Find an algebraic expression without parenthesis for the area of this lot. That is, write $(x + 4)(x + 3)$ as a quadratic expression in standard form.
2. The planner found this expression in the developer's plan one day:
"Build a lot whose area is $x^2 + 4x + 2x + 8$ "

Help the planner by finding how the developer planned to change the original square lot.

3. What do you suppose each of these entries means?
- a. "Build a lot whose area is $x^2 + 4x + 6x + 24$ "
- b. "Build a lot whose area is $x^2 + 6x + 2x + 12$ "
- c. "Build a lot whose area is $x^2 + 5x + 6$ "
- d. "Build a lot whose area is $x^2 + 8x + 15$ "
- e. "Build a lot whose area is $x^2 + 5x - 14$ "
- f. "Build a lot whose area is $x^2 - 7x + 10$ "
4. As you were completing these problems, what pattern did you notice? Write a rule that generalizes your process.