ACTIVITY 11.7

Developing Concepts

Group Activity for use with Lesson 11.7

Modeling Polynomial Division

GROUP ACTIVITY
Work with a partner.

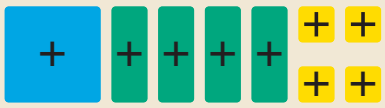
MATERIALS
algebra tiles

QUESTION **How can you use algebra tiles to model division of polynomials?**

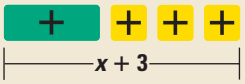
EXPLORING THE CONCEPT

You can use algebra tiles to divide $x^2 + 4x + 4$ by $x + 3$ as follows.

1 Use algebra tiles to model $x^2 + 4x + 4$.



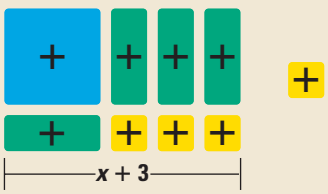
2 Use the tiles to create a length of $x + 3$.



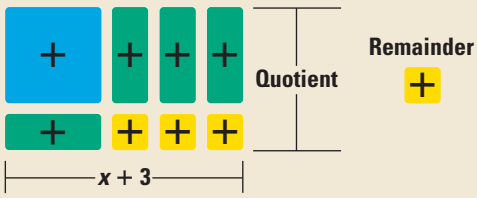
STUDENT HELP

Look Back
For help with algebra tiles, see pp. 575 and 603.

3 Keeping $x + 3$ as the length, try to create a rectangle that uses all the tiles from **Step 1**. Explain why some tiles cannot be used.



4 The width of the rectangle is the quotient and the leftover tiles are the remainder. Give the quotient and the remainder when you divide $x^2 + 4x + 4$ by $x + 3$.



DRAWING CONCLUSIONS

Use algebra tiles to decide whether the polynomial can be divided evenly. Make a sketch of your explanation. Compare your result with that of your partner. Then decide together on the quotient and the remainder if any.

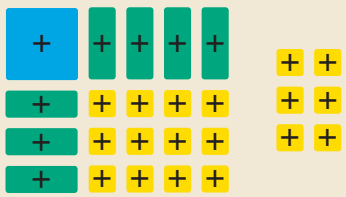
1. $(x^2 + 4x + 8) \div (x + 2)$

2. $(x^2 + 7x + 8) \div (x + 1)$

3. $(x^2 + 6x + 12) \div (x + 4)$

4. $(x^2 + 9x + 25) \div (x + 5)$

5. Use the model at the right to find the missing values in the division.



Dividend ↓ ? ÷ (x + 4) = ? , Remainder ?
Divisor ↑ (x + 4)
Quotient ↑ ?

6. With polynomial division, as with whole number division, you can check your work by multiplying the divisor by the quotient and then adding the remainder. Use the model in Exercise 5 to explain why this method works. Then use polynomial multiplication to check the division in Exercise 5.