

Modeling Activity

(Use with Lesson 12-4)

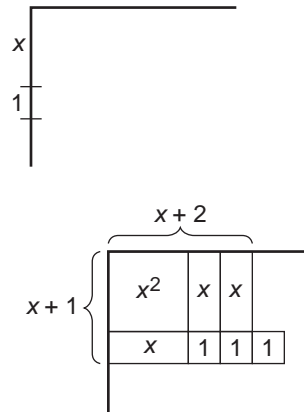
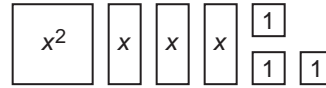
Dividing Polynomials

Materials: algebra tiles , product mat 

You can use algebra tiles as a model for dividing polynomials.

Activity: Use algebra tiles to divide $x^2 + 3x + 3$ by $x + 1$.

- ▶ Model the polynomial $x^2 + 3x + 3$.
 - ▶ Use your algebra tiles to mark off the divisor $x + 1$ along the side of the product mat.
 - ▶ Try to arrange the tiles to form a rectangle with a width of $x + 1$ units. Notice that there is an extra 1-tile. This tile represents the remainder.
 - ▶ The tiles form a rectangle with a width of $x + 1$ units and a length of $x + 2$ units, and there is one 1-tile left over. Therefore, $x^2 + 3x + 3$ divided by $x + 1$ equals $x + 2$ with a remainder of 1. Since the remainder of 1 can be expressed as the fraction $\frac{1}{x+1}$,
- $$(x^2 + 3x + 3) \div (x + 1) = x + 2 + \frac{1}{x + 1}.$$



7. Since division is the inverse of multiplication, modeling division of polynomials is the opposite of modeling multiplication of polynomials. The divisor is marked along the width and the algebra tiles that represent the dividend are manipulated to form a rectangle with that width.

MODEL

Use algebra tiles to find each quotient.

1. $(x^2 + 4x + 3) \div (x + 3)$ **$x + 1$**
2. $(x^2 - 5x + 6) \div (x - 2)$ **$x - 3$**
3. $(x^2 - 2x - 3) \div (x - 3)$ **$x + 1$**
4. $(x^2 + 2x - 8) \div (x + 4)$ **$x - 2$**
5. $(x^2 + 5x + 8) \div (x + 2)$
 $x + 3 + \frac{2}{2x + 2}$
6. $(x^2 - 3x - 5) \div (x - 4)$
 $x + 1 - \frac{1}{x - 4}$

WRITE

7. How does the relationship between multiplication and division help you to model division of polynomials?
 8. When dividing polynomials, how is the remainder expressed in the answer?
- 8. Sample answer: A fraction is formed with the remainder as the numerator and the divisor as the denominator. This fraction is added to the quotient.**