13-7

Name _____ Date _____

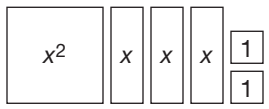
Factoring Polynomials (Pages 588–591)

When you know a product but you want to find its factors, you use a process called **factoring**. You can use algebra tiles or pencil and paper to factor **trinomials**. A trinomial is a polynomial with three factors.

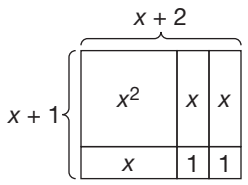
EXAMPLES

A Factor $x^2 + 3x + 2$.

Use algebra tiles to model the polynomial.



Try to form a rectangle with the tiles.



The rectangle has a width of $x + 1$ and a length of $x + 2$. Therefore, $x^2 + 3x + 2 = (x + 1)(x + 2)$.

B Factor $x^2 + 8x + 15$.

Use paper and pencil.

$x^2 + 8x + 15 = (x +$? $)(x +$? $)$

You know that there are two factors whose product is the polynomial.

Which two numbers have a sum of 8 and a product of 15? 3 and 5

So $x^2 + 8x + 15 = (x + 3)(x + 5)$.

Try These Together

Factor each polynomial.

1. $4x + 8$
HINT: One factor is 4.

2. $3r + 6$
HINT: One factor is $r + 2$.

3. $6x + 18$
HINT: The factors are a monomial and a binomial.

PRACTICE

Factor each polynomial.

4. $5x + 25$ **5.** $4y + 16$ **6.** $7a + 7$

7. $9q + 18$ **8.** $5x + 10$ **9.** $3x + 12$

If possible, factor each polynomial. Use drawings or algebra tiles if necessary.

10. $x^2 + 4x + 4$ **11.** $x^2 + 5x + 10$ **12.** $x^2 + 4x + 3$

13. $x^2 + 10x + 21$ **14.** $x^2 + 10x + 25$ **15.** $s^2 + 7s + 12$

16. For the polynomial $x^2 + 5x +$?, write a positive integer in the blank that makes the polynomial factorable.

17. **Standardized Test Practice** If possible, factor the polynomial $x^2 + 4x + 5$.

A $(x + 4)(x + 1)$ **B** $(x + 1)(x + 4)$ **C** $(x + 3)(x + 2)$ **D** not possible

Answers: **1.** $4(x + 2)$ **2.** $3(r + 2)$ **3.** $6(x + 3)$ **4.** $5(x + 5)$ **5.** $4(y + 4)$ **6.** $7(a + 1)$ **7.** $9(q + 2)$ **8.** $5(x + 2)$ **9.** $3(x + 4)$ **10.** $(x + 2)(x + 2)$ **11.** not factorable **12.** $(x + 1)(x + 3)$ **13.** $(x + 3)(x + 7)$ **14.** $(x + 5)(x + 5)$ **15.** $(s + 3)(s + 4)$ **16.** 4 or 6 **17.** D