EXPLORATION Warm Up

8-3 Factoring $x^2 + bx + c$

Look for patterns as you multiply binomials. The patterns that you discover will help you factor trinomials.

1. Complete the table by multiplying the binomial factors. Be sure to write the products as trinomials in the form $x^2 + bx + c$.

Factors	Product
$(x + 2)(x + 4)$	$x^2 + 6x + 8$
$(x + 5)(x + 3)$	$x^2 + 8x + 15$
$(x + 3)(x - 7)$	$x^2 - 4x - 21$
$(x - 5)(x + 2)$	$x^2 - 3x - 10$
$(x - 5)(x - 9)$	$x^2 - 14x + 45$

2. Look at the constant terms of the trinomials. How are these related to the constant terms of the binomial factors?
If you multiply them, they equal 'c'
3. Look at the coefficients of the middle terms of the trinomials. How are these related to the constant terms of the binomial factors? If you add them, they equal 'b'

THINK AND DISCUSS

4. **Discuss** what you know about the constant terms of the binomial factors of $x^2 + 10x + 24$.
Two numbers must multiply to 24 & add up to 10

5. **Explain** how you know that $(x + 12)(x + 2)$ is not a correct factorization of $x^2 + 10x + 24$.
they add up to 14x not 10x

24	
1	24
2	12
3	8
4	6

$(x+4)(x+6)$