NAME _____ DATE _____

Module 12 Simplifying Algebraic Expressions by Factoring Polynomials
Lesson 4 Factoring $x^2 + bx + c$

Factor, if possible.

1. $x^2 + 4x + 3$

2. $u^2 + 9u + 18$

3. $a^2 + 11a + 28$

4. $b^2 + 11b + 24$

5. $p^2 + 7p + 14$

6. $m^2 + 9m + 20$

7. $k^2 - 5k + 6$

8. $d^2 - 7d + 12$

9. $n^2 - 9n + 14$

10. $r^2 - 8r + 16$

11. $y^2 - 13y + 36$

12. $z^2 - 10z + 24$

13. $h^2 - 2h - 8$

14. $v^2 - v - 12$

15. $w^2 - 4w - 3$

16. $q^2 - 2q - 48$

17. $a^2 - 11a - 42$

18. $m^2 - 12m - 64$

19. $f^2 + 4f - 5$

20. $c^2 + 7c - 18$

21. $n^2 + 5n - 14$

22. $t^2 + 5t - 24$

23. $g^2 + 8g - 20$

24. $s^2 + s - 42$

Journal

1. Explain why the trinomial $z^2 - 7z - 10$ cannot be simplified into two binomial factors.
2. Nicholas says the factored form of $x^2 - 3x - 18$ is $(x + 6)(x - 3)$. Explain why his solution is incorrect. What would the trinomial need to be for his solution to be correct?
3. If both the second and third terms in a trinomial are negative, what must be true about its binomial factors? Explain.
4. Create a trinomial of the form $x^2 + bx + c$, where $b > 0$ and $c > 0$, which can be factored. Explain each step for factoring it.
5. Explain how factoring a trinomial is related to the FOIL Method.

Cumulative Review

Factor, if possible.

1. $3b + 9$

2. $12z^2 - 18z - 6$

3. $9c^2d + 3cd^2 - 15c$

4. $p(m + n) + 2(m + n)$

5. $4r^2 - 2rq - 2rq + q^2$

6. $2s^2 + 3st - 2st - 3t^2$

7. $49x^2 - 16$

8. $25n^2 - 4$

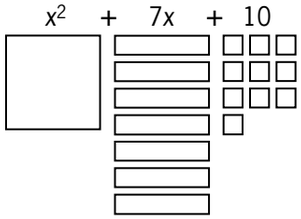
Factor using algebra tiles.

9. $z^2 - 9$

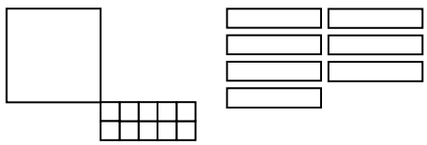
10. $9b^2 - 1$

Manipulatives

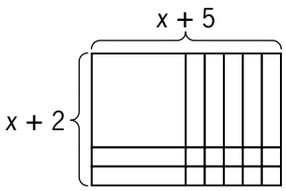
Algebra tiles can be used to factor trinomials. Use algebra tiles to factor $x^2 + 7x + 10$. Begin by modeling the trinomial.



Then, arrange the 1's tiles so they form a rectangle. These could be arranged as a 2×5 rectangle or a 1×10 rectangle. Now, arrange the tiles so the lower right corner of the x^2-tile and the upper left corner of the 1's tiles are touching.



Finally, fill in the *x*-rectangles above and to the left of the 1-squares to form a rectangle. All tiles should be used in forming a rectangle. If there are too few *x*-rectangles or if there are *x*-rectangles left over, start over with a different configuration of 1's tiles or try adding zero pairs.



$x^2 + 7x + 10 = (x + 2)(x + 5)$

Use algebra tiles to simplify the following:

1. $x^2 + 2x - 3$

2. $x^2 - 9x + 18$

3. $x^2 - 3x - 28$

4. $x^2 - 10x - 24$