Name _____ Period _____ Date _____

Factoring Trinomials: $ax^2 + bx + c$

Use the guess and check strategy and the FOIL method to factor a trinomial.

Example

Factor $-22x + 6x^2 - 8$.

First, rewrite the trinomial so that the terms are in descending order. Then check for a GCF.

$-22x + 6x^2 - 8 = 6x^2 - 22x - 8$

$= 2(3x^2 - 11x - 4)$ *The GCF of the terms is 2. Use the Distributive Property.*

Now factor $3x^2 - 11x - 4$.

$3x^2 - 11x - 4$

$3x^2 + (\_?\_ + \_?\_)x - 4$

The product of 3 and −4 is −12.

*You need to find two integers whose **product is −12** and whose **sum is −11**.*

Factors of −12	Sum of Factors	
−3, 4	−3 + 4 = 1	no
3, −4	3 + −4 = −1	no
−1, 12	−1 + 12 = 11	no
1, −12	1 + (−12) = −11	yes

Stop listing factors when you find a pair that works.

$3x^2 - 11x - 4 = 3x^2 + [1 + (-12)]x - 4$ *Select the factors 1 and −12.*

$= 3x^2 + 1x - 12x - 4$ *Simplify.*

$= (3x^2 + 1x) + (-12x - 4)$ *Group terms that have a common monomial factor.*

$= x(3x + 1) - 4(3x + 1)$ *Factor.*

$= (x - 4)(3x + 1)$ *Use the Distributive Property.*

Therefore, $6x^2 - 22x - 8 = 2(x - 4)(3x + 1)$.

Practice

Complete.

1. $b^2 + b - 6 = (b + 3)(b - \_?\_)$
2. $a^2 + 2a - 8 = (a + \_?\_)(a - 2)$
3. $x^2 - 3x - 10 = (x - \_?\_)(x + 2)$
4. $k^2 + 9k + 18 = (k + 6)(k + \_?\_)$
5. $8g^2 - 4g - 12 = (\_?\_ + 4)(2g - 3)$
6. $5n^2 - 22n + 8 = (5n - \_?\_)(n - 4)$

Factor each trinomial.

7. $x^2 + x - 12$
8. $y^2 - 5y - 14$
9. $k^2 - 15k + 50$
10. $a^2 - 4a - 12$
11. $z^2 + 11z + 24$
12. $3s^2 + 9s - 30$
13. $2x^2 + 3x - 20$
14. $9x^2 - 18x + 5$
15. $20x^2 + 17x + 3$

16. **Geometry** The area of a rectangle is $(6x^2 + 7x + 2)$ square inches. Find binomial expressions to represent the dimensions of this rectangle.

17. **Standardized Test Practice** Factor the trinomial $v^2 + 7v + 12$.

A $(v + 7)(v + 5)$ **B** $(v + 4)(v - 3)$ **C** $(v + 3)(v + 4)$ **D** $(v + 12)(v - 5)$

Answers: 1. 2 2. 4 3. 5 4. 3 5. 4g 6. 2 7. $(x + 4)(x - 3)$ 8. $(y - 7)(y + 2)$ 9. $(k - 5)(k - 10)$ 10. $(a - 6)(a + 2)$ 11. $(z + 8)(z + 3)$ 12. $3(s + 5)(s - 2)$ 13. $(2x - 5)(x + 4)$ 14. $(3x - 1)(3x - 5)$ 15. $(4x + 1)(5x + 3)$ 16. $3x + 2$ by $2x + 1$ 17. C

Name _____ Date _____ Period _____

Assignment _____

SHOW YOUR WORK IN THE SPACES PROVIDED *(one problem per space and number the problems)*

SHOW YOUR WORK IN THE SPACES PROVIDED *(one problem per space and number the problems)*