

10-3

NAME _____ DATE _____

Factoring Trinomials (Pages 574–580)

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.

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

$$= 2(3x^2 - 11x - 4) \quad \text{The GCF of the terms is 2. Use the distributive property.}$$

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

$$3x^2 - 11x - 4$$

The product of 3 and -4 is -12 .

$$3x^2 + (\underline{\quad} + \underline{\quad})x - 4$$

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.

$$3x^2 - 11x - 4 = 3x^2 + [1 + (-12)]x - 4 \quad \text{Select the factors 1 and } -12.$$

$$= 3x^2 + 1x - 12x - 4$$

$$= (3x^2 + 1x) + (-12x - 4) \quad \text{Group terms that have a common monomial factor.}$$

$$= x(3x + 1) - 4(3x + 1) \quad \text{Factor.}$$

$$= (x - 4)(3x + 1) \quad \text{Use the distributive property.}$$

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

PRACTICE

Complete.

- $b^2 + b - 6 = (b + 3)(b - \underline{\quad})$
- $a^2 + 2a - 8 = (a + \underline{\quad})(a - 2)$
- $x^2 - 3x - 10 = (x - \underline{\quad})(x + 2)$
- $k^2 + 9k + 18 = (k + 6)(k + \underline{\quad})$
- $8g^2 - 4g - 12 = (\underline{\quad} + 4)(2g - 3)$
- $5n^2 - 22n + 8 = (5n - \underline{\quad})(n - 4)$

Factor each trinomial.

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

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, 4, 3, 5, 4g, 6. 2, 7, (x + 4)(x - 3), 8. (v - 7)(v + 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