NAME _____ DATE _____ PERIOD _____

Study Guide and Intervention *(continued)*

Solving Quadratic Equations by Factoring

Solve Equations by Factoring When you use factoring to solve a quadratic equation, you use the following property.

Zero Product Property	For any real numbers a and b, if $ab = 0$, then either $a = 0$ or $b = 0$, or both a and $b = 0$.

Example **Solve each equation by factoring.**

a. $3x^2 = 15x$

$3x^2 = 15x$	Original equation
$3x^2 - 15x = 0$	Subtract $15x$ from both sides.
$3x(x - 5) = 0$	Factor the binomial.
$3x = 0$ or $x - 5 = 0$	Zero Product Property
$x = 0$ or $x = 5$	Solve each equation.

The solution set is $\{0, 5\}$.

b. $4x^2 - 5x = 21$

$4x^2 - 5x = 21$	Original equation
$4x^2 - 5x - 21 = 0$	Subtract 21 from both sides.
$(4x + 7)(x - 3) = 0$	Factor the trinomial.
$4x + 7 = 0$ or $x - 3 = 0$	Zero Product Property
$x = -\frac{7}{4}$ or $x = 3$	Solve each equation.

The solution set is $\left\{-\frac{7}{4}, 3\right\}$.

Exercises

Solve each equation by factoring.

1. $6x^2 - 2x = 0$

2. $x^2 = 7x$

3. $20x^2 = -25x$

4. $6x^2 = 7x$

5. $6x^2 - 27x = 0$

6. $12x^2 - 8x = 0$

7. $x^2 + x - 30 = 0$

8. $2x^2 - x - 3 = 0$

9. $x^2 + 14x + 33 = 0$

10. $4x^2 + 27x - 7 = 0$

11. $3x^2 + 29x - 10 = 0$

12. $6x^2 - 5x - 4 = 0$

13. $12x^2 - 8x + 1 = 0$

14. $5x^2 + 28x - 12 = 0$

15. $2x^2 - 250x + 5000 = 0$

16. $2x^2 - 11x - 40 = 0$

17. $2x^2 + 21x - 11 = 0$

18. $3x^2 + 2x - 21 = 0$

19. $8x^2 - 14x + 3 = 0$

20. $6x^2 + 11x - 2 = 0$

21. $5x^2 + 17x - 12 = 0$

22. $12x^2 + 25x + 12 = 0$

23. $12x^2 + 18x + 6 = 0$

24. $7x^2 - 36x + 5 = 0$