Algebra 1 8.5

Use the distributive property to factor polynomials

Solve quadratic equations by factoring

quadratic
factor
distributive property
greatest common factor (GCF)
zero product property
whiteboards

## KeyConcept Zero Product Property

| | |
|---|---|
| **Words** | If the product of two factors is 0, then at least one of the factors must be 0. |
| **Symbols** | For any real numbers $a$ and $b$, if $ab = 0$, then $a = 0$, $b = 0$, or both $a$ and $b$ equal zero. |

(  )(  ) = 0

$x^3a - 3x^2a^2 + 5ax$

$x \times x \otimes a \otimes a$ $\quad 3 \times a \otimes a \otimes a$ $\quad 5 \otimes a \otimes x$

$ax(x^2 - 3xa + 5)$

$16x^2a + 12a^3x - 2a^4x^3$

$2xa(8x + 6a^2 + a^3x^2 \quad )$

## Example 4 Solve Equations

**Solve each equation. Check your solutions.**

**a.** $(2d + 6)(3d - 15) = 0$

$0 \cdot ($

$? \cdot ? = 0$

$2d + 6 = 0$

$-6 \quad -6$

$\frac{2d}{2} = \frac{-6}{2}$

$d = -3$

$3d - 15 = 0$

$+15 \quad +15$

$\frac{3d}{3} = \frac{15}{3}$

$d = 5$

**GuidedPractice**

**4A.** $3n(n + 2) = 0$

$3n^2 + 6n = 0$

$(\quad)(\quad) = 0$

$3n = 0$, $\frac{3n}{3} = \frac{0}{3}$, $n = 0$

$n + 2 = 0$, $-2 \quad -2$, $n = -2$

$(n - 6)(n + 3) = 0$

$n - 6 = 0$, $+6 \quad +6$, $n = 6$

$n + 3 = 0$, $-3 \quad -3$, $n = -3$

$(a + 5)(a - 3) = 0$

$a + 5 = 0$, $-5 \quad -5$, $a = -5$

$a - 3 = 0$, $+3 \quad +3$, $a = 3$

**4B.** $8b^2 - 40b = 0$

$8b$ $8b$

$(8b)(b-4) = 0$

$8b = 0$ $\quad b - 4 = 0$

$+4 \quad +4$

$\frac{8b}{8} = \frac{0}{8}$

$b = 0$ $\quad b = 4$

WB

1-12

19-23

must be in factored form...
= 0

**b.** $c^2 = 3c$

**4C.** $x^2 = -10x$