

COMPLETING THE SQUARE

SECTION 4-6

Mr. Gallo
Algebra 2

COMPLETING THE SQUARE

- ✘ $(x+b)^2 = x^2 + 2bx + b^2$ is a Quadratic expression formed by squaring a binomial.
- ✘ It is called a perfect Square trinomial as a result.
- ✘ Completing the Square turns any quadratic equation into a perfect square trinomial.

Theorem:

To complete the square on $x^2 + bx$, add $\left(\frac{1}{2}b\right)^2$

$$x^2 + bx + \left(\frac{1}{2}b\right)^2 = \left(x + \frac{1}{2}b\right)^2 = \left(x + \frac{b}{2}\right)^2$$



Standard Form $y = ax^2 + bx + c$

Use the Theorem for Completing the Square to solve

Quadratic Equations and to rewrite

Standard Form Equations to Vertex

Form Equations of a parabola.

COMPLETE THE SQUARES ON THE FOLLOWING:

a) $x^2 + 30x + 15^2 = x^2 + 30x + 225$

$$\frac{30}{2} = 15$$

b) $x^2 - 16x + (-8)^2 = x^2 - 16x + 64$

$$\frac{-16}{2} = -8$$

c) $x^2 + 2bx + (b)^2 = x^2 + 2bx + b^2$

$$\frac{2b}{2} = b$$

Complete Got It? #4a on p. 235

Use Completing the Square to Solve: $3x^2 + 18x - 3 = 0$

- 1). Rewrite the equation so that only terms with x are on one side and divide all terms by the coefficient of x^2 if it is not 1.

$$\frac{3x^2}{3} + \frac{18x}{3} = \frac{3}{3}$$

$$x^2 + 6x = 1$$

- 2). Complete the square by adding $\left(\frac{b}{2}\right)^2$ to each side of the equation.

$$x^2 + 6x + \left(\frac{6}{2}\right)^2 = 1 + \left(\frac{6}{2}\right)^2$$

$$x^2 + 6x + 9 = 10$$

- 3). Factor the Trinomial.

$$\sqrt{(x+3)^2} = \sqrt{10}$$

- 4). Find the square roots.

$$x + 3 = \pm\sqrt{10}$$

- 5). Solve for x .

$$x = -3 \pm \sqrt{10}$$

Complete Lesson Check #3, 5, 7
on p. 237

3). 1

5). 4

7). 2500

Homework: p. 237 #12-16 even, 29-33 odd, 37-45
odd, 90, 92, 97

**3 OUT OF 2
PEOPLE
— HAVE —
TROUBLE
— WITH —
FRACTIONS**

**HOMEWORK: P. 237 #36-42 EVEN, 46-51, 53, 55, 68-70,
91, 96, 98**