



9.2 Completing the Square

Need To Know



- The idea of completing the square
- Completing the square as a number skill
- Completing the square to solve quadratics



Completing the Square

Recall how easy it is to solve

$$(x - 2)^2 = 9$$

Consider

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



Completing the Square

Figure out what constant term to add to make the polynomial factor into a perfect square.

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

$$x^2 - 10x + \underline{\quad} = (\quad)^2$$

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

$$x^2 + 24x + \underline{\quad} = (\quad)^2$$

$$x^2 + bx + \underline{\quad} = (\quad)^2$$



Practice Completing the Square

Figure out what constant term to add to make the polynomial factor into a perfect square.

$$x^2 - 14x + \underline{\quad} = (\quad)^2$$

$$x^2 + 5x + \underline{\quad} = (\quad)^2$$



Completing the Square

Solve by completing the square:

$$x^2 - 6x - 7 = 0$$



Completing the Square

Solve by completing the square:

$$3y^2 + 12y + 6 = 0$$

How to Solve by Completing the Square

1. Put equation in $ax^2 + bx = c$ form.
2. If a is not 1, divide by a on both sides.
3. Add the complete square number to both sides.
4. Solve the equation by the square root method (see 9.1)

Completing the Square

Solve by completing the square:

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

How to Solve by Completing the Square

1. Put equation in $ax^2 + bx = c$ form.
2. If a is not 1, divide by a on both sides.
3. Add the complete square number to both sides.
4. Solve the equation by the square root method (see 9.1)

9.2 Conclusion

Ways to Solve Quadratic Equations

1. Factoring method (see 5.6)
(Set up: equation must equal zero)
2. Square root method
(Set up: "squared stuff" by itself)
3. Completing the square method
(Set up: the leading coefficient = 1)

Rating	Doable
Easy	Not always
Easy	Not always