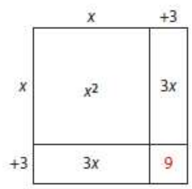
18. You can also solve quadratic equations that do not factor into perfect squares by using an algebraic method called *completing the square.* In this method, a quadratic expression is made into a perfect square. For example,

Original equation	$x^2 + 6x + 4 = 0$
Subtract 4 from both sides.	$x^2 + 6x = -4$
Add 9 to both sides of the equation to make one side of the equation into a perfect square trinomial.	$x^2 + 6x + 9 = -4 + 9$
Simplify.	$x^2 + 6x + 9 = 5$
Factor the trinomial.	$(x + 3)^2 = 5$
Take the square root of both sides.	$x + 3 = \pm\sqrt{5}$
Subtract 3 from both sides.	$x = -3 \pm\sqrt{5}$



The solutions in radical form are $-3 + \sqrt{5}$ and $-3 - \sqrt{5}$.

a. Solve $x^2 + 10x - 56 = 0$ by completing the square. Leave your answer in radical form, if necessary.

b. Solve $y^2 - 4y - 5 = 0$ by completing the square. Leave your answer in radical form, if necessary.

c. Solve $x^2 + 4x + 1 = 0$ by completing the square. Leave your answer in radical form, if necessary.

a) $x^2 + 10x + \underline{25} = 56 + \underline{25}$

$\left(\frac{10}{2}\right)^2 = (5)^2$

$(x+5)^2 = 81$

$x + 5 = \pm 9$

$x = -5 \pm 9$

$x = -5 + 9$ or $x = -5 - 9$

$x = 4$ or $x = -14$

b) $y^2 - 4y + \underline{4} = 5 + \underline{4}$

$\left(\frac{-4}{2}\right)^2 = (-2)^2$

$(y-2)^2 = 9$

$y - 2 = \pm 3$

$y = 2 \pm 3$

$y = 2 + 3$ or $y = 2 - 3$

$y = 5$ or $y = -1$

c) $x^2 + 4x + \underline{4} = -1 + \underline{4}$

$\left(\frac{4}{2}\right)^2 = (2)^2$

$(x+2)^2 = 3$

$x + 2 = \pm\sqrt{3}$

$x = -2 \pm \sqrt{3}$