Expand each.

$(x+6)^2 =$ $x^2+12x+36$

$(x-4)^2 =$ $x^2-8x+16$

$(x+11)^2 =$ $x^2+22x+121$

$(x-7)^2 =$ $x^2-14x+49$

$x^2 - 24x + 144 = (x - 12)^2$

$x^2 - 18x + 81 = (x - 9)^2$

$x^2 + 10x + 25 = (x + 5)^2$

$x^2 + 13x + 36 = (x+9)(x+4)$

This would have to be 12x for it to factor like the others.

$x^2 - 20x + 100 = (x - 10)^2$

$x^2 + 6x + 9 = (x + 3)^2$

$x^2 - 2x + 1 = (x - 1)^2$

$x^2 - 22x + 121 = (x - 11)^2$

$x^2 + 36x + 324 = (x + 18)^2$

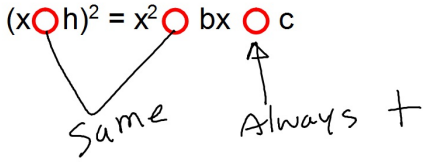
$x^2 - 4x + 4 = (x - 2)^2$

What relationships do you see here?

$$(x+6)^2 = x^2 + 12x + 36$$
$$(x-4)^2 = x^2 - 8x + 16$$
$$(x+11)^2 = x^2 + 22x + 121$$
$$(x-7)^2 = x^2 - 14x + 49$$
$$(x+8)^2 = x^2 + 16x + 64$$
$$(x-5)^2 = x^2 - 10x + 25$$

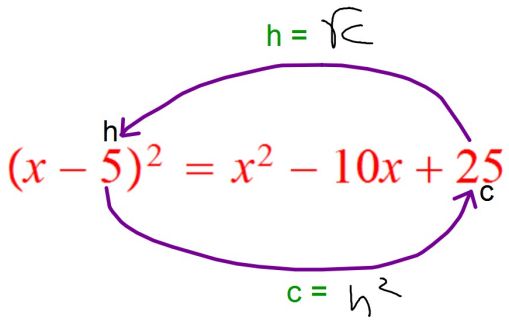
$(x + h)^2 = x^2 + bx + c$

Relationships amongst the signs



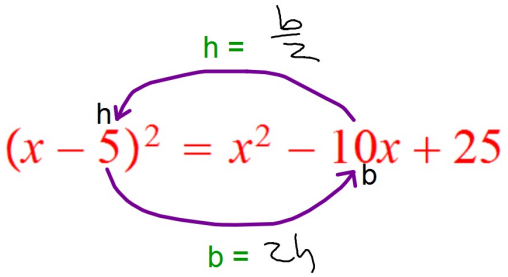
$(x + h)^2 = x^2 + bx + c$

Relationships between h and c



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

Relationships between h and b



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

Relationships between b and c

b = -10

$(x-5)^2 = x^2 - 10x + 25$

b → c

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

Sec 5-7

Fill in the blanks

half of b squared

half of b

1. $x^2 + 20x +$ __100__ $= (x$ __+10__ $)^2$

2. $x^2 - 4x +$ __4__ $= (x$ __-2__ $)^2$

This is called "Completing the Square."

The constant in the trinomial is half of b, squared: $(b/2)^2$

$(x-5)^2 = x^2 - 10x + 25$

$ax^2 + bx + c$

The constant in the parentheses is half of b: b/2

In general, to complete the square:

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

2nd

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

1st

Complete the square for each.

1. $x^2 - 12x = (x \quad)^2$
2. $x^2 + 20x = (x \quad)^2$
3. $x^2 - 2x = (x \quad)^2$

Complete the square for each.

1. $x^2 - 12x + 36 = (x - 6)^2$
2. $x^2 + 20x + 100 = (x + 10)^2$
3. $x^2 - 2x + 1 = (x - 1)^2$

Complete the square for each.

4. $x^2 + 46x = (x \quad)^2$ → $x^2 + 46x + 529 = (x + 23)^2$
5. $x^2 - 38x = (x \quad)^2$ → $x^2 - 38x + 361 = (x - 19)^2$
6. $x^2 + 3x = (x \quad)^2$ → $x^2 + 3x + \frac{9}{4} = (x + \frac{3}{2})^2$

Solve by Completing the Square:

1. Get the equation into the following form: $x^2 + bx = c$
2. Complete the square so the equation becomes: $(x - h)^2 = k$
3. Solve for x using Square Roots.

Solving by completing the square works best if:

1. a = 1
2. b is even

Solve by Completing the Square.

$x^2 + 22x - 5 = 0$ Move 5 to the right side

$x^2+22x+121 = 5+121$ Complete the square by adding 121 to both sides

$(x+11)^2 = 126$ Write the left side in factored form

$\sqrt{(x+11)^2} = \sqrt{126} \rightarrow \sqrt{9 \cdot 14}$ Solve by using Square Roots

$x+11 = \pm 3\sqrt{14}$

$-11 \quad -11$

$x = -11 \pm 3\sqrt{14}$