Completing the Square

May 19, 2015

What pattern do you notice from the "b" term to the "h" term?

$\frac{b}{2} \rightarrow h$

How do you get the "c" term?

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

The idea of property of equality states:

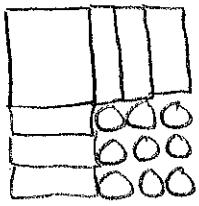
whatever you do to one side, you do to the other

The idea of zero pairs:

adding zero does not change the value of an equation

Complete to get a perfect square ☺

$x^2 + 6x$



$y = x^2 + 6x$

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

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

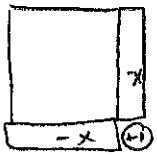
Solve for y

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

$-9 \quad -9$

$y = (x+3)^2 - 9$

$x^2 - 2x$



$y = x^2 - 2x$

$y + 1 = x^2 - 2x + 1$

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

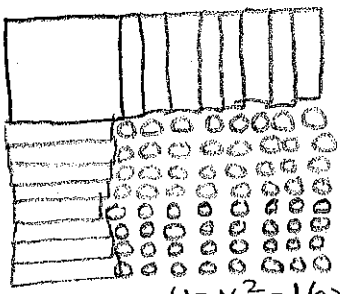
Solve for y

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

$-1 \quad -1$

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

$x^2 - 16x$



$y = x^2 - 16x$

$y + 64 = x^2 - 16x + 64$

$y + 64 = (x-8)^2$

Solve for y

$y = (x-8)^2 - 64$

Per 3→ we will go over tmrw!

$x^2 - 7x$

To get c → $\left(\frac{b}{2}\right)^2$ $\left(\frac{-7}{2}\right)^2 = (-3.5)^2$

$y + 12.25 = x^2 - 7x + 12.25$

$y + 12.25 = (x-3.5)^2$

$y = (x-3.5)^2 - 12.25$

$x^2 - 5x$

To get c → $\left(\frac{b}{2}\right)^2 \rightarrow \left(\frac{-5}{2}\right)^2$

$(-2.5)^2$

6.25

$y = x^2 - 5x$

$y + 6.25 = x^2 - 5x + 6.25$

$y + 6.25 = (x-2.5)^2$

$y = (x-2.5)^2 - 6.25$

$x^2 + 20x$

$y = x^2 + 20x$

$y + 100 = x^2 + 20x + 100$

$y + 100 = (x+10)^2$

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