5-5 COMPLETING THE SQUARE

Trinomial Squares $A^2 + 2AB + B^2 = (A + B)^2$
$A^2 - 2AB + B^2 = (A - B)^2$

ex. 1 Complete the trinomial squares and factor.

$\left(\frac{-16}{2}\right)^2$
a) $x^2 - 16x + 64 = (x-8)^2$
$(x)^2 - 2(8)(x) + (8)^2$

$\left(\frac{50}{2}\right)^2$
b) $x^2 + 50x + 625 = (x + 25)^2$

$\left(\frac{7}{2}\right)^2$
c) $x^2 + 7x + \frac{49}{4} = \left(x + \frac{7}{2}\right)^2$

Solve by completing the square (CTS)

ex. 2 $x^2 + 6x - 8 = 0$

$x^2 + 6x + 9 = 8 + 9$

$\sqrt{(x+3)^2} = \sqrt{17}$

$x + 3 = \pm\sqrt{17}$

$x = -3 \pm \sqrt{17}$

ex. 3 $x^2 - 12x + 44 = 0$

$x^2 - 12x + 36 = -44$
$\qquad +36$

$\sqrt{(x-6)^2} = \sqrt{-8}$

$x - 6 = \pm 2i\sqrt{2}$

$x = 6 \pm 2i\sqrt{2}$

ex. 4

$$\frac{4x^2 - 12x + 4 = 0}{4}$$

$$x^2 - 3x + \frac{9}{4} = -1 + \frac{9}{4}$$

$$\sqrt{\left(x - \frac{3}{2}\right)^2} = \sqrt{\frac{5}{4}}$$

$$x - 3/2 = \frac{\pm\sqrt{5}}{2}$$

$$x = \frac{3 \pm \sqrt{5}}{2} \quad \text{or} \quad \frac{3}{2} \pm \frac{\sqrt{5}}{2}$$