Warm-up

Work on your Warm-up.

1. What is the difference between expression and equation?

$x^2 \cdot x^2 = x^4$

$\sqrt{\frac{1}{4}} = \frac{\sqrt{1}}{\sqrt{4}} = \frac{1}{2}$

Simplify the following expressions:

x^4-9

$(x^2-3)(x^2+3)$

$1/4x^2-36$

$(\frac{1}{2}x-6)(\frac{1}{2}x+6)$

x^2+49

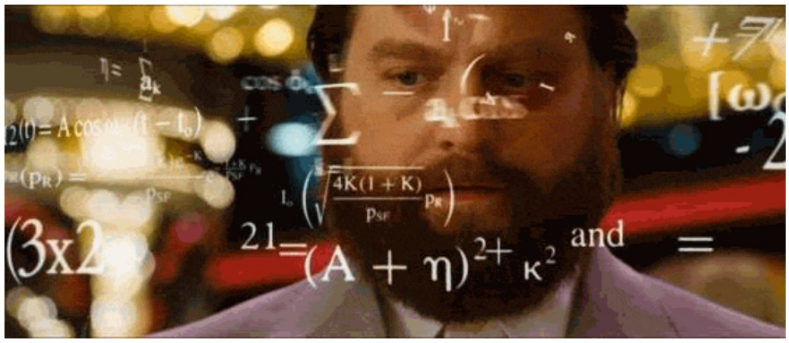
not factorable

Agenda:

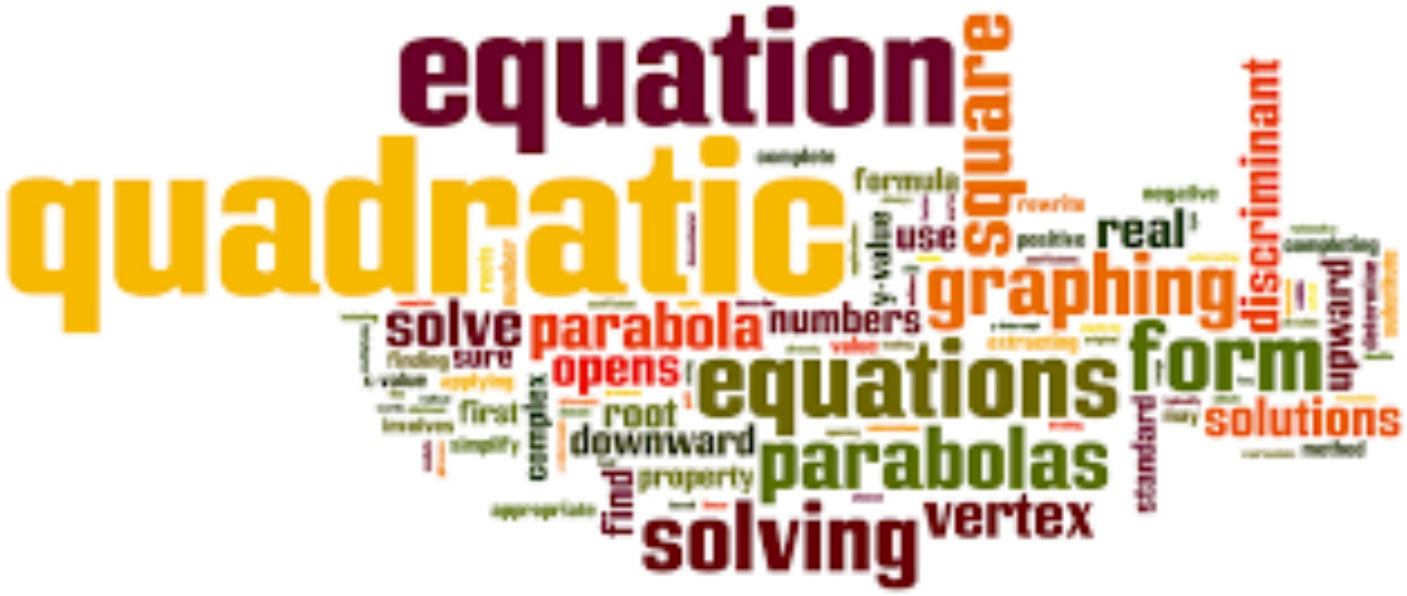
1)Completing the square to ***solve quadratic equations***! - Notes

2)Bingo

3)Exit Ticket



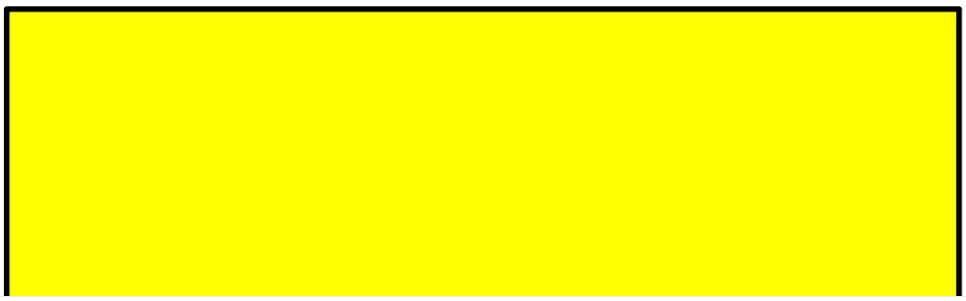
Solving Quadratic Equations by
Completing the Square



Few terms to consider...

Since now we are *solving* quadratic equations now... 

- We are going to get solutions.
- Other words for "solutions":
- "Roots"
- "Zeros"



Steps for Completing the Square

Key Concepts, *continued*

Completing the Square to Solve Quadratics

1. Make sure the equation is in standard form, $ax^2 + bx + c$.
2. Subtract c from both sides.
3. Divide each term by a to get a leading coefficient of 1.
4. Add the square of half of the coefficient of the x-term to both sides to complete the square.
5. Express the perfect square trinomial as the square of a binomial.
6. Solve by using square roots.

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

$x^2+2x-15=0$

$+15 \quad +15$

$x^2+2x=15$

$x^2+2x+1=15+1$

$\sqrt{(x+1)^2}=\sqrt{16}$

$x+1=\pm 4$

$-1 \qquad -1$

$\frac{2}{2}=1^2=1$

$x=3,-5$

Solve by completing the square:

$3x^2+15x+12=0$

$-12 \quad -12$

$\frac{3x^2+15x}{3}=\frac{-12}{3}$

$x^2+5x=-4$

$x^2+5x+\frac{25}{4}=-4+\frac{25}{4}$

$\sqrt{(x+5/2)^2}=\sqrt{\frac{9}{4}}$

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

$\frac{25}{4}$

$x+\frac{5}{2}=\pm\frac{3}{2}$

$-\frac{5}{2} \qquad -\frac{5}{2}$

$x=-1,-4$

$2x^2+8x-7=-2$

$+7 \quad +7$

$\frac{2x^2}{2}+\frac{8x}{2}=\frac{5}{2}$

$x^2+4x=\frac{5}{2}$

$x^2+4x+4=\frac{5}{2}+4$

$\sqrt{(x+2)^2}=\sqrt{\frac{13}{2}}$

$x+2=\pm\sqrt{\frac{13}{2}}$

$-2 \qquad -2$

$x=-2\pm\sqrt{\frac{13}{2}}$

$\frac{4}{2}=2^2=4$

***In your own words,* what is the most confusing step for you?**

Solve by completing the square:

$6x^2+18x+12=0$

$-12 \quad -12$

$\frac{6x^2}{6}+\frac{18x}{6}=\frac{-12}{6}$

$x^2+3x=-2$

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

$\frac{3}{2}=\left(\frac{3}{2}\right)^2=\frac{9}{4}$

$\sqrt{\left(x+\frac{3}{2}\right)^2}=\sqrt{\frac{1}{4}}$

$x+\frac{3}{2}=\pm\frac{1}{2}$

$-\frac{3}{2} \quad -\frac{3}{2}$

$x=\frac{1}{2}-\frac{3}{2}=\frac{-2}{2}=-1$

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

$2x^2-4x+5=6$

$-5 \quad -5$

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

$x^2-2x=\frac{1}{2}$

$-\frac{2}{2}=-1^2=1$

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

$\sqrt{(x-1)^2}=\sqrt{\frac{3}{2}}$

$x-1=\pm\sqrt{\frac{3}{2}}$

$+1 \quad +1$

$x=1\pm\sqrt{\frac{3}{2}}$

11) $k^2 - 4k + 1 = -5$ $\quad \frac{-4}{2} = -2^2 = 4$

$-1 \quad -1$

$k^2 - 4k = -6$

$k^2 - 4k + 4 = -6 + 4$

$\sqrt{(k-2)^2} = \sqrt{-2}$

$k - 2 = \pm\sqrt{-2}$

$k - 2 = \pm i\sqrt{2}$

$+2 \quad +2$

$k = 2 \pm i\sqrt{2}$