BE-1B WEDNESDAY 1-16-08

- TAKE OUT LAST NIGHT's Homework.

- Be READY TO TAKE NOTES, put your trays and seatbacks in the upright position, you are about to meet...

"THE" QUADRATIC FORMULA!

Ch. 10-4 Solving (Any) Quadratic Equation Using the Quadratic Formula

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The solutions to $ax^2+bx+c=0$ where $a \neq 0$, b or c may be 0 are given by the QF (Quadratic Formula)

$$x = \frac{-b \pm \sqrt{d}}{2a}$$

where d is the discriminant b^2-4ac

Long version (see AHSGE reference sheet)

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$\sqrt{d}$ if d is perfect square, you get an integer

$\sqrt{d}$ if d is NOT perfect square, you get an irrational number

$\sqrt{d}$ if d is negative, STOP, NO SOLUTION, cannot take square root of a negative number.

(Ex) Solve using QF

$$x^2 - 2x - 24 = 0$$

$a = 1$ $\quad b^2 - 4ac$

$b = -2$ $\quad (-2)^2 - 4(1)(-24)$

$c = -24$ $\quad 4 + 96 = \boxed{100 = d}$

↑ perfect square, you could solve by factoring or by QF

$$x = \frac{-b \pm \sqrt{d}}{2a}$$

$$x = \frac{-(\ ) \pm \sqrt{(100)}}{2(\ )}$$

$$x = \frac{-(-2) \pm 10}{2(1)} = \frac{2 \pm 10}{2}$$

⊕

$$x = \frac{2+10}{2}$$

$$x = \frac{12}{2}$$

$$\boxed{x = 6}$$

⊖

$$x = \frac{2-10}{2}$$

$$x = \frac{-8}{2}$$

$$\boxed{x = -4}$$

* RATIONAL "roots" or SOLUTIONS

X-INTERCEPTS FOR $x^2 - 2x - 24 = y$

(Ex) Solve by QF $4x^2 + 2x = 17$

* PUT IN STANDARD FORM !

$$4x^2 + 2x - 17 = 0$$

$a = 4$ $\quad b^2 - 4ac$

$b = 2$ $\quad (2)^2 - 4(4)(-17)$ *

$c = -17$ $\quad 4 + 272 = \boxed{276 = d}$

* 17×16: $10^{4}2$, 17, 272

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(2) \pm \sqrt{276}}{2(4)}$$

* NOT PERFECT SQUARE, IRRATIONAL SOLUTION

$$x = \frac{-2 \pm 16.61}{8}$$

⊕

$$x = \frac{-2 + 16.61}{8}$$

$$x = \frac{14.61}{8}$$

$$x = 1.826$$

$$\boxed{x = 1.83}$$

⊖

$$x = \frac{-2 - 16.61}{8}$$

$$x = \frac{-18.61}{8}$$

$$x = -2.332$$

$$\boxed{x = -2.33}$$

↑ NEAREST HUNDREDTH UNLESS TOLD OTHERWISE

Homework:

- Read Ch. 10-4
- Pg 550 # 15, 16, 18, 22, 23