NAME: _____ Period: _____

SHEET # 0151:

1.5 COMPLEX SOLUTIONS TO THE QUADRATIC EQUATION

$ax^2+bx+c=0$

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

DISCRIMINANT

$D=b^2-4ac > 0$ 2 Real Solutions = X-INTERCEPTS

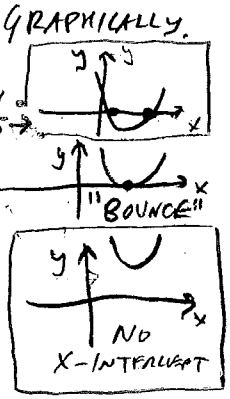
$D=b^2-4ac = 0$ 1 Real Solution REPEATED TWICE

$D=b^2-4ac < 0$ 2 Complex Solutions

↓

CONJUGATE PAIRS!

GRAPHICALLY.



Ex. $x^2+4=0$

$x=\pm\sqrt{-4}$

$x=\pm 2i$ $x=2i, x=-2i$

$\pm Vi$ or $u\pm Vi$ $\begin{cases} u+Vi \\ u-Vi \end{cases}$

Ex. $3x^2-2x+5=0$

$$x=\frac{-(-2)\pm\sqrt{(-2)^2-4(3)(5)}}{(2\cdot 3)}=\frac{2\pm\sqrt{4-60}}{6}$$

$$=\frac{1}{3}\pm\frac{\sqrt{-56}}{6}=\frac{1}{3}\pm\frac{\sqrt{14}\,i}{3}$$

$\begin{cases} \frac{1}{3}+\frac{\sqrt{14}}{3}i \\ \frac{1}{3}-\frac{\sqrt{14}}{3}i \end{cases}$

$\sqrt{56}=\sqrt{4\cdot 14}=2\sqrt{14}$. $\frac{\sqrt{-56}}{6}=\frac{2\sqrt{14}\,i}{3}$.