Name:	Date:	Period:

4.7 All Methods of Solving Quadratics Notes

$$x^2 - 6x + 5 = 0$$

Solve. Show detailed steps.

The solutions should be the same regardless of the method.

Factoring and Zero Product Property	$(x-5)(x-1)=0$ $x-5=0 \quad x-1=0$ $x=5 \quad x=1$
Square Roots	The square root method can not be used. The quadratic has a x term.
Completing the Square	$x^2-6x+\underline{9}=-5+\underline{9}$ $\left(\frac{-6}{2}\right)^2=(-3)^2=9$ $(x-3)^2=4$ $x-3=\pm\sqrt{4}$ $x-3=2 \quad x-3=-2$ $x=5 \quad x=1$
$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ Quadratic Formula	$a=1 \quad b=-6 \quad c=5$ $x=\frac{-(-6)\pm\sqrt{(-6)^2-4(1)(5)}}{2(1)}$ $=\frac{6\pm\sqrt{36-20}}{2}$ $=\frac{6\pm\sqrt{16}}{2}=\frac{6\pm4}{2}$

$x=\frac{6+4}{2} \qquad x=\frac{6-4}{2}$

$=\frac{10}{2} \qquad =\frac{2}{2}$

$x=5 \qquad x=1$

Quadratics have 1 real solution, 2 real solutions, or 2 complex solution (conjugate pairs).

You can determine the number of solutions a quadratic has by evaluating the discriminant

$\boxed{b^2 - 4ac}$

The expression under the radical in the quadratic formula

> 0 2 real solutions

$= 0$ 1 real solution

< 0 complex solutions (0 real number solutions)

Example $x^2 - 6x + 5 = 0$

$a = 1$ $b = -6$ $c = 5$

$(-6)^2 - 4(1)(5)$

$36 - 20$

$16 \rightarrow$ 2 real solutions