Correspondence between Solutions and Factors:

If p and q are solutions to a quadratic equation, then the equation is equivalent to

$$(x - p)(x - q) = 0.$$

Identifying Prime Quadratic Polynomials using $b^2 - 4ac$:

If the greatest common factor of a, b, and c is 1, then

$ax^2 + bx + c$ is prime if and only if $b^2 - 4ac$ is not a perfect square.