**Factoring Quadratic Expressions and Solving Quadratic Equations Using WolframAlpha**

There is a distinction between factoring a quadratic expression and solving a quadratic equation.

Factor  Solve 



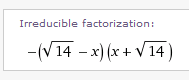
We use factoring when applying the zero product rule to solve a quadratic equation.

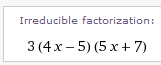
If we find the quadratic expression in the equation *not factorable* we usually use the quadratic formula or completing the square with the square root property to solve the equation.

We may use the command *factor* in WolframAlpha to factor expressions.

Example 1. Factor  Example 2. Factor 







If everything was factorable could we use the zero product rule to solve every quadratic equation?

Use WolframAlpha to **factor** each expression then use the zero product rule to solve the quadratic equation.

1.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 

2. = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 

WolframAlpha will always factor over the complex numbers. We usually restrict our factoring to rational numbers. If we use WolframAlpha to factor, we must look over the solution to decide if it is *our* kind of factoring.

Use WolframAlpha to factor each expression over the rationals. If the polynomial is not factorable with rational numbers, state *not factorable*.

3.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7.  = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Which of the equations in (4) – (7) will have solutions over the real numbers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Does *not factorable* mean *no real solution*? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_