## Lesson 9: Standard Form and Factored Form

* Let’s write quadratic expressions in different forms.

### 9.1: Math Talk: Opposites Attract

Solve each equation mentally.

### 9.2: Finding Products of Differences

1. Show that and are equivalent expressions by drawing a diagram or applying the distributive property. Show your reasoning.
2. For each expression, write an equivalent expression. Show your reasoning.

### 9.3: What is the Standard Form? What is the Factored Form?

The quadratic expression is written in **standard form**.

Here are some other quadratic expressions. The expressions on the left are written in standard form and the expressions on the right are not.

Written in standard form:

Not written in standard form:

1. What are some characteristics of expressions in standard form?
2. and in the right column are quadratic expressions written in **factored form**. Why do you think that form is called factored form?

#### Are you ready for more?

What quadratic expression can be described as being both standard form and factored form? Explain how you know.

### Lesson 9 Summary

A quadratic function can often be represented by many equivalent expressions. For example, a quadratic function might be defined by . The quadratic expression is called the **standard form**, the sum of a multiple of and a linear expression ( in this case).

In general, standard form is

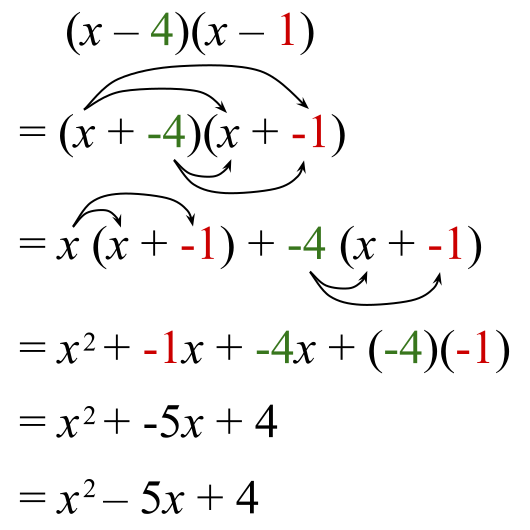
We refer to as the coefficient of the squared term , as the coefficient of the linear term , and as the constant term.

The function can also be defined by the equivalent expression . When the quadratic expression is a product of two factors where each one is a linear expression, this is called the **factored form**.

An expression in factored form can be rewritten in standard form by expanding it, which means multiplying out the factors. In a previous lesson we saw how to use a diagram and to apply the distributive property to multiply two linear expressions, such as . We can do the same to expand an expression with a sum and a difference, such as , or to expand an expression with two differences, for example, .

To represent with a diagram, we can think of subtraction as adding the opposite:

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