Unit 6 Lesson 9: Standard Form and Factored Form

1 Math Talk: Opposites Attract (Warm up)

Student Task Statement

Solve each equation mentally.

$40 - 8 = 40 + n$

$25 + \text{-}100 = 25 - n$

$3 - \frac{1}{2} = 3 + n$

$72 - n = 72 + 6$

2 Finding Products of Differences

Student Task Statement

1. Show that $(x - 1)(x - 1)$ and $x^2 - 2x + 1$ 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.
   a. $(x + 1)(x - 1)$

   b. $(x - 2)(x + 3)$

   c. $(x - 2)^2$

Activity Synthesis

$$(x - 1)(x - 1)$$

$$= (x + \text{-}1)(x + \text{-}1)$$

$$= x\,(x + \text{-}1) + \text{-}1\,(x + \text{-}1)$$

$$= x^2 + \text{-}1x + \text{-}1x + (\text{-}1)(\text{-}1)$$

$$= x^2 + \text{-}2x + 1$$

$$= x^2 - 2x + 1$$

3 What is the Standard Form? What is the Factored Form?

Student Task Statement

The quadratic expression $x^2 + 4x + 3$ 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:

$$x^2 - 1$$ $$(2x + 3)x$$

$$x^2 + 9x$$ $$(x + 1)(x - 1)$$

$$\tfrac{1}{2}x^2$$ $$3(x - 2)^2 + 1$$

$$4x^2 - 2x + 5$$ $$\text{-}4(x^2 + x) + 7$$

$$\text{-}3x^2 - x + 6$$ $$(x + 8)(\text{-}x + 5)$$

$$1 - x^2$$

1. What are some characteristics of expressions in standard form?

2. $(x + 1)(x - 1)$ and $(2x + 3)x$ in the right column are quadratic expressions written in **factored form**. Why do you think that form is called factored form?