Name _____ Date _____ Period ____

Formulating Absolute Value Linear Equations

TEACHER KEY | Algebra II | Unit 2 | Day 4 | TEK A2.6.D

Objective: I can formulate (set up, without solving) an absolute value linear equation from a real-world description.

Vocabulary

Formulate: set up an equation from a description - **do not solve it yet**.

Center value: the **target/ideal number** the situation is measured against.

Margin: how far off from the center is **still acceptable**.

KEY IDEA

Every situation today fits the same template:

$|x - \text{center}| = \text{margin}$

x is the true/measured value; center is the target; margin is the acceptable difference.

Let's Work Through It

Example 1 — Clarissa wants a house within 5 houses of house #1248 on an even-numbered street.

Center: **1248** Margin: **5** Equation: **$|x - 1248| = 5$**

Example 2 — A surveying instrument measures a 10-mile stretch with a 1.5% margin of error.

Equation: **$1.5 = |x - 10|/10 \cdot 100$**

Example 3 — A retail company's AI demand-forecasting model is trusted as accurate only if its prediction is within 25 units of the actual demand of 400 units.

Center: **400** Margin: **25** Equation: **$|x - 400| = 25$**

Example 4 — A recipe calls for 2 cups of flour, with acceptable measurement error of 0.25 cups.

Center: **2** Margin: **0.25** Equation: **$|x - 2| = 0.25$**

Example 5 — A shipping company's box-weight target is 50 lb, with a tolerance of 3 lb.

Equation: **$|x - 50| = 3$**

Your Turn

You Try 1 — A factory's bolt length must be within 0.02 cm of 6 cm.

Equation: **$|x - 6| = 0.02$**

You Try 2 — A thermostat targets 70°F, with an acceptable range of 2°F above or below. Formulate an equation.

Center: **70** Margin: **2** Equation: **$|x - 70| = 2$**