

Algebra 1 Lesson 5.4
Writing Equations in Standard Form

Name Rogers Key

Objectives:

- Rewrite a given equation in standard form.
- Rewrite an equation in standard form when given the slope and y-intercept.
- Write the equation of a linear model (real-life application) in standard form.

5.4 Standard Form

COEFFICIENTS OF X & Y

$$ax + by = c$$

CONSTANT

EQUATIONS IN STANDARD FORM CANNOT HAVE:

- 1) a negative a value → MULTIPLY EVERYTHING BY -1
- 2) NO FRACTIONS → MULTIPLY EVERYTHING BY DENOMINATOR

Standard form of a linear equation:

Practice 1: Rewrite the equation in standard form.

a) $y = 2x - 5$
 $-2x + y = -5$

b) $y = 5x - \frac{1}{2}$
 $-5x + y = -\frac{1}{2}$

c) $2y + 6x = 7$
 $6x + 2y = 7$

d) $0.25x = -3y - 1$
 $0.25x + 3y = -1$

When given the slope and y-intercept, you must first use slope-intercept form and then rewrite in standard form.

Practice 2: Write the equation in standard form (use slope-intercept form first!)

a) slope = $-\frac{4}{3}$, y-intercept = 2
 $m = -\frac{4}{3}$ $b = 2$

b) $b = 5$, $m = -3$

Slope-intercept form:

Slope-intercept form:

$$y = -\frac{4}{3}x + 2$$

$$y = -3x + 5$$

Standard form: $\frac{4}{3}x + y = 2$

Standard form: $3x + y = 5$

Modeling Real-World Situations

Some real-world situations are more easily written in standard form!

Example: Dominion is having a family movie night. The cost of the tickets are \$5 for a child and \$8 for an adult. Write an equation to model this situation if the schools purchase totals \$1200.

$$\$5x + \$8y = \$1200$$

Follow-up Question:

If the school purchased 85 adult tickets, how many child tickets were purchased?

$$5x + \$8(85) = \$1200$$

$$5x + 680 = 1200$$

$$-680 \quad -680$$

$$5x = 520 \quad = x = 104$$

104 child tickets

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Name: Rogers Key

COEFFICIENTS OF X & Y **Bell Ringer**

Standard Form: $ax + by = c$

- * Equations in Standard Form cannot have:
- 1) A negative a value
 - 2) NO FRACTIONS

→ CONSTANT
→ MULTIPLY EVERYTHING BY -1.
→ MULTIPLY BY LCD.

$2 \cdot \frac{1}{2}$
 $+$

Directions: Write the following equations in standard form.

1. $y = -\frac{1}{3}x + 2$

$+\frac{1}{3}x \quad +\frac{1}{3}x$

$3 \cdot \frac{1}{3}x + y = 2 \quad = \quad \boxed{x + 3y = 6}$

2. $\frac{3}{4}x - \frac{1}{2}y = 7$

LCD: 4 $\boxed{3x - 2y = 28}$

3. $2y = 3x - 4$

$-3x \quad -3x$

$(-1) \cdot 3x + 2y = -4 \quad = \quad \boxed{3x - 2y = 4}$

4. $y = x + 1$

$-x \quad -x$

$(-1) \cdot x + y = 1 \quad = \quad \boxed{x - y = -1}$

5. $5x - \frac{2}{5}y = 9$

LCD: 5

$\boxed{25x - 2y = 45}$

