Standard Form of a Linear Equation

Algebra 1 •Section 5.4

Name: _____	Date: _____	Score: _____ / 12

Quick Review and Helpful Hints

Linear relationships have a constant rate of change. Use slope, intercepts, points, and context to move between equations, tables, graphs, and real-world meanings.

▷ **Example:** Write the line with slope 2 through $(3, 11)$.
Work: Use $y = 2x + b$. Substitute the point: $11 = 2(3) + b$, so $b = 5$.

★ **Answer:** $y = 2x + 5$

Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Rewrite $y = 2x + 5$ in standard form.

2. Rewrite $3x + 2y = 12$ in slope-intercept form.

3. Find the x-intercept of $4x + 2y = 16$.

4. Find the y-intercept of $5x - y = 10$.

5. Rewrite $y = -\frac{2}{3}x + 4$ in standard form.

6. Is $2x + 3y = 6$ in standard form?

7. Find intercepts of $6x + 3y = 18$.

8. Rewrite $x = 7$ in standard form.

9. Rewrite $y = -4$ in standard form.

10. Solve $2x + 5y = 20$ for y.

Word Problems

11. Tickets cost $\$6$ for students and $\$9$ for adults. Write revenue equation for $\$180$.

12. A recipe uses 2 cups flour per loaf and 3 cups per cake, with 24 cups available. Write standard form.

Answer Keys

1. $2x - y = -5$
2. $y = -\frac{3}{2}x + 6$
3. 4
4. -10
5. $2x + 3y = 12$
6. Yes
7. x-int 3; y-int 6
8. $x = 7$
9. $y = -4$
10. $y = -\frac{2}{5}x + 4$
11. $6s + 9a = 180$
12. $2l + 3c = 24$

Step-by-Step Explanations

1. Standard form wants the variables together, so move y left and let the constant settle on the right.
2. Take $3x$ to the other side, then divide the whole line by 2 to leave y standing alone.
3. The x-intercept lives where $y = 0$, which collapses things to $4x = 16$, so $x = 4$.
4. Set $x = 0$ and you're left with $-y = 10$; flip the sign to find $y = -10$.
5. Multiply through by 3 to wipe out the fraction, then carry $2x$ to the left side.
6. It checks every box — whole-number coefficients with x and y teamed up on one side.
7. Zero out one variable at a time: $y = 0$ gives $x = 3$, and $x = 0$ gives $y = 6$.
8. It's already there — a vertical line fits standard form with $A = 1$ and no y-term.
9. Nothing to change — a horizontal line works with $B = 1$ and the x-term simply absent.
10. Move $2x$ off to the right, then split everything by 5 to get y by itself.
11. Each ticket type earns price times count, and adding those totals gives the full $\$180$.
12. Loaves and cakes each draw from the same flour jar, so their amounts add up to the 24 cups.

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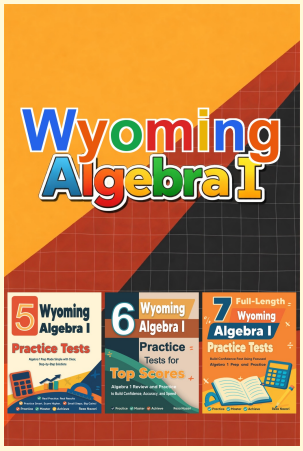

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