

Standard Form of a Linear Equation

Algebra 1 • Section 5.4

Name: _____

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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.

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

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

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

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

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

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

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

5. Rewrite $y = -\frac{2}{3}x + 4$ 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. $x\text{-int } 3; y\text{-int } 6$

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

- Standard form wants the variables together, so move y left and let the constant settle on the right.
- Take $3x$ to the other side, then divide the whole line by 2 to leave y standing alone.
- The x -intercept lives where $y = 0$, which collapses things to $4x = 16$, so $x = 4$.
- Set $x = 0$ and you're left with $-y = 10$; flip the sign to find $y = -10$.
- Multiply through by 3 to wipe out the fraction, then carry $2x$ to the left side.
- It checks every box — whole-number coefficients with x and y teamed up on one side.

- Zero out one variable at a time: $y = 0$ gives $x = 3$, and $x = 0$ gives $y = 6$.
- It's already there — a vertical line fits standard form with $A = 1$ and no y -term.
- Nothing to change — a horizontal line works with $B = 1$ and the x -term simply absent.
- Move $2x$ off to the right, then split everything by 5 to get y by itself.
- Each ticket type earns price times count, and adding those totals gives the full \$180.
- Loaves and cakes each draw from the same flour jar, so their amounts add up to the 24 cups.



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